

Fishery Management Report No. 07-08

Kodiak Management Area Annual Herring Fisheries Management Report, 2005

by
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and
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March 2007

Alaska Department of Fish and Game

Divisions of Sport Fish and Commercial Fisheries



Symbols and Abbreviations

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Weights and measures (metric)		General		Measures (fisheries)	
centimeter	cm	Alaska Administrative		fork length	FL
deciliter	dL	Code	AAC	mid-eye-to-fork	MEF
gram	g	all commonly accepted		mid-eye-to-tail-fork	METF
hectare	ha	abbreviations	e.g., Mr., Mrs., AM, PM, etc.	standard length	SL
kilogram	kg			total length	TL
kilometer	km	all commonly accepted			
liter	L	professional titles	e.g., Dr., Ph.D., R.N., etc.	Mathematics, statistics	
meter	m			<i>all standard mathematical</i>	
milliliter	mL	at	@	<i>signs, symbols and</i>	
millimeter	mm	compass directions:		<i>abbreviations</i>	
		east	E	alternate hypothesis	H _A
		north	N	base of natural logarithm	<i>e</i>
		south	S	catch per unit effort	CPUE
		west	W	coefficient of variation	CV
		copyright	©	common test statistics	(F, t, χ^2 , etc.)
		corporate suffixes:		confidence interval	CI
		Company	Co.	correlation coefficient	
		Corporation	Corp.	(multiple)	R
		Incorporated	Inc.	correlation coefficient	
		Limited	Ltd.	(simple)	r
		District of Columbia	D.C.	covariance	cov
		et alii (and others)	et al.	degree (angular)	°
		et cetera (and so forth)	etc.	degrees of freedom	df
		exempli gratia		expected value	<i>E</i>
		(for example)	e.g.	greater than	>
		Federal Information		greater than or equal to	≥
		Code	FIC	harvest per unit effort	HPUE
		id est (that is)	i.e.	less than	<
		latitude or longitude	lat. or long.	less than or equal to	≤
		monetary symbols		logarithm (natural)	ln
		(U.S.)	\$, ¢	logarithm (base 10)	log
		months (tables and		logarithm (specify base)	log ₂ , etc.
		figures): first three		minute (angular)	'
		letters	Jan,...,Dec	not significant	NS
		registered trademark	®	null hypothesis	H ₀
		trademark	™	percent	%
		United States		probability	P
		(adjective)	U.S.	probability of a type I error	
		United States of		(rejection of the null	
		America (noun)	USA	hypothesis when true)	α
		U.S.C.	United States	probability of a type II error	
			Code	(acceptance of the null	
		U.S. state	use two-letter	hypothesis when false)	β
			abbreviations	second (angular)	"
			(e.g., AK, WA)	standard deviation	SD
				standard error	SE
				variance	
				population	Var
				sample	var
Weights and measures (English)					
cubic feet per second	ft ³ /s				
foot	ft				
gallon	gal				
inch	in				
mile	mi				
nautical mile	nmi				
ounce	oz				
pound	lb				
quart	qt				
yard	yd				
Time and temperature					
day	d				
degrees Celsius	°C				
degrees Fahrenheit	°F				
degrees kelvin	K				
hour	h				
minute	min				
second	s				
Physics and chemistry					
all atomic symbols					
alternating current	AC				
ampere	A				
calorie	cal				
direct current	DC				
hertz	Hz				
horsepower	hp				
hydrogen ion activity	pH				
(negative log of)					
parts per million	ppm				
parts per thousand	ppt,				
	‰				
volts	V				
watts	W				

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REPORT 2005**

by

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ABSTRACT

The Kodiak Management Area (KMA) 2005 commercial Pacific herring *Clupea pallasii* sac roe fishery extended from April 15 through June 30. A total of 32 purse seine and 12 gillnet fishermen harvested 3,463 tons, compared to the preseason guideline harvest level (GHL) of 3,475 tons. A total of 43 sections were open to fishing and harvests occurred within 26 of these sections. The herring sac roe fishery is managed under an allocative harvest strategy that provides 75% of the total Kodiak GHL to seine gear and 25% to gillnet gear. Purse seine fishermen accounted for 2,932 tons (85%) and gillnet fishermen harvested 531 tons (15%) of the total catch. Roe recovery percentages averaged 10.7% for seine harvest and 10.6% for gillnet harvest. The total exvessel value of the fishery was an estimated \$1,731,500. Age-4 (33%), age-6 (22%), age-8 (13%), and age-5 (12%) herring were the dominant age classes harvested by the purse seine fleet. Age-6 herring (39%) were the dominant age class harvested by the gillnet fleet.

Herring abundance overall in the KMA has been increasing during the last five years. The overall KMA herring stock status in 2005 showed continued increases in abundance from 2003 and 2004 levels in several sections along the westside of Kodiak (Uganik and Uyak Bays), along the eastside of Kodiak (Sitkalidak Straits, Kiluیدا Bay, and Ugak Bay), and on the southend of Kodiak in the Alitak District. In the Afognak District herring stocks in the southern portion of the district increased while those on the westside declined. Recruitment (age-3 herring) was strong in the Alitak District and some sections of the Eastside District. No new stock status information is available for the Mainland District.

The KMA herring food/bait fishery was designated a limited entry fishery in 2001 when 5 purse seine and 4 trawl permits were issued. A combine fishery was conducted in the 2001-2005 seasons due to the small GHLs and only one permit holder was allowed to fish. There was no allocation of Lower Cook Inlet, Kamishak stock herring in the Shelikof Strait due to the concerns of low stock status and young age classes of Kamishak herring. The department opened that portion of the Uganik District south of the latitude of Miners Point on September 28 and two trips harvested 168 tons (156 ton GHL) which closed this district on December 22, 2005. The Eastside District (85 ton GHL), the Uyak District (33 ton GHL), and the Alitak District (28 ton GHL) could have been opened during the 2005/2006 season; however, no request was made to the department to open these fisheries.

Subsistence herring harvests were reported from a total of 37 subsistence permits through November 22, 2006. The total subsistence herring harvest for the KMA in 2005 was 5,335 pounds.

Key words: Kodiak, Herring, *Clupea pallasii*, sac roe commercial fishery, food and bait commercial fishery, subsistence fishery, stock status.

INTRODUCTION

This report presents information concerning the commercial Pacific herring *Clupea pallasii* sac roe, food and bait, and subsistence fisheries that occurred in the Kodiak Management Area (KMA) in 2005. This includes a regulatory history, historical harvest data by fishery, age and weight data collected from the commercial harvest, stock status, and a summary of fishery management activity. This report is intended as a reference document; interpretation and discussion of the data are therefore limited.

The KMA comprises the entire Kodiak Archipelago and that portion of the Alaska Peninsula that extends from Cape Douglas southwest to Kilokak Rocks. The archipelago is approximately 250 Km (150 mi) long, extending from Shuyak Island south to the Trinity Islands. The Alaska Peninsula portion of the KMA is about 267 Km (160 mi) long and is separated from the archipelago by Shelikof Strait that averages 50 Km (30 mi) in width (Figure 1).

HERRING SAC ROE FISHERY

HISTORICAL PERSPECTIVE (1964 TO 2005)

The commercial herring sac roe fishery began in Kodiak in 1964. From 1964 through 2005 herring sac roe harvests averaged 1,983 short tons (Table 1; Figure 2). From 1964 through 1977

purse seine gear was used exclusively, with an average annual harvest of 898 tons. Prior to 1974 the sac roe fishery was unregulated with regard to harvest quotas, gear types, seasons, and fishing periods. Annual harvests, effort levels, herring abundance, prices, and processor interest, fluctuated greatly between 1964 and 1977. Improved market conditions in 1978 prompted increased effort in this fishery with 29 purse seine and 11 gillnet permit holders participating (Manthey et. al. 1978). Between 1977 and 1982 the regulatory and management strategy went through a rapid development phase (Manthey et. al. 1982). It was during this period that spotter aircraft and tenders were incorporated into the fishery. Regulatory changes focused on gear efficiency, gear conflicts between seine and gillnet fishermen, and gear restrictions (exclusive registration and limited entry).

In the 1990s, closures of the Prince William Sound and Kamishak herring sac roe fisheries and increases in the Kodiak herring stocks resulted in increases in seine effort in the Kodiak fishery. Many of the inactive Kodiak seine permits were purchased by “circuit seiners” (herring fishermen who participate in all of Alaska’s major herring fisheries from Sitka Sound to Bristol Bay). These circuit seiners had experienced crews and were equipped with high quality sonar electronics, nets, and vessels. With the addition of the circuit seiners to the already efficient local Kodiak seine fleet, effort levels grew with 73 units of gear fished landings in 1995 (Table 2). The increased seine effort made controlling harvests difficult. Regulatory changes involved several seine depth reductions and shorter seine fishing periods to reduce harvest rates. Herring prices dropped from a record high of \$2,000 per ton in 1996 to a record low of \$500 per ton in 1997, 1998, and 2001 - 2005 (Table 2). With the sharp decline in prices, effort levels also dropped and gillnet gear accounted for a diminishing percent of the total harvest in the late 1990s (Table 2). In 2000, an allocative harvest strategy, including separate gear areas and harvest opportunity allocations, was established in regulation.

Season Dates

From 1974 through 1978 the season extended from March 1 through June 30 (Manthey 1979). From 1979 through 1981 it was reduced to May 1 through June 30 (Manthey et. al. 1979). In 1982 the season opening date was changed to April 15 (Manthey et. al. 1982). The April 15 to June 30 season dates still remain in effect (5 AAC 27.510).

Fishing Periods

Fishing periods from 1964 through 1978, for both gear types, were 24 hours per day, seven days per week (Manthey 1979). In 1979 and 1980 the fishing periods were 48-hour openings followed by 24-hour closures (Manthey et. al. 1980). In 1981 the fishing periods were further reduced to 24-hour openings followed by 24-hour closures (noon on odd-numbered days of the month to noon on even-numbered days of the month), which remained in effect through 1994. In 1995 fishing periods were reduced for both gear types by emergency order (EO) to 10 hours from April 21 to May 2, to reduce harvest rates.

Since 1996 gillnet fishing periods were separated from the seine periods and were again set at 24-hour openings followed by 24-hour closures for the duration of the season.

From 1996 through 1999 fishing periods for purse seiners were limited to 13 hours in duration from April 15 through May 4, and beginning on May 5 fishing periods were increased to 24 hours in duration followed by 24-hour closures for the remainder of the season (Gretsch 2001a). In 2000 through 2004, fishing periods in most sections were 12 hours in duration from April 15 through May 7, and from May 8 through June 30 they were 13 hours in duration, with 24-hour closures

between periods (Gretsch 2004). In 2002 through 2004 the department used emergency order (EO) authority to reduce fishing period duration in sections that had high effort levels and a large available biomass, in order to control harvests (Gretsch 2004). In 2005 BOF regulation changes adopted the EO style of managing certain sections in regulation (5 AAC 27.510(a)).

Gear

Purse seine gear was unrestricted in this fishery through 1973. In 1974 it was limited to 150 fathoms in length and 1,000 meshes in depth. In 1979 gillnet lengths were first limited to a maximum of 300 fathoms with no depth restriction. In 1981 the maximum lengths were reduced to 150 fathoms for gillnets and 100 fathoms for purse seines; these regulations remained in effect through 1995. Also, in 1981 trawls and beach seines were eliminated as legal gear for the sac roe fishery. In 1996 purse seine depths were restricted to a maximum of 20 fathoms and gillnet depths were restricted to 230 meshes. In 2000 the seine depth was reduced to a maximum of 18 fathoms.

Gear Levels

Beginning in 1979, combined gear levels increased substantially, reaching a high of 201 units (92 seine and 109 gillnet) in 1980 and 193 units (79 seine and 114 gillnet) in 1981 (Table 2; Figure 3). With the implementation of limited entry following the 1981 sac roe season, entry into the fishery was restricted to past participants until permanent transferable permits could be awarded. From 1982 through 1993 gear levels were relatively constant with 29 to 45 seiners and 62 to 86 gillnetters participating. With an increase in herring abundance and prices, and the closure of the Prince William Sound herring fishery, seine gear participation increased abruptly during the 1994 through 1997 seasons, with 73 purse seine permit holders fishing in 1995. The escalation in seine gear participation resulted in increased competition among seiners and between seiners and gillnetters. In 1997 and 1998 herring prices declined (Table 2). After 1997 seine participation fell over 50% (average 31 vessels). Gillnet gear participation took an even sharper drop after 2000 when the 59 permit holders fishing in 1997 declined to an annual average of 11 gillnet fishermen (Table 2).

Guideline Harvest Levels

From 1974 through 1978 there was an area-wide harvest quota of 3,400 tons. From 1979 through 1984 the area-wide harvest quota was reduced to 2,400 tons (Table 2) and guideline harvest levels (GHLs) were established for four large geographical areas. Descriptions of districts and sections were established in regulation in 1981, when 7 districts and 46 sections were identified. Starting in 1985 GHLs were established by section on an annual basis and were based on stock status trends. From 1985 through 2001 the combined annual GHLs of all sections ranged from a high of 4,550 tons in 1994 to a low of 1,495 tons in 1999 (Table 2). From 1999 through 2002 GHLs for the fishery were at low levels, based on more conservative management and, for some sections, declines in herring abundance. Starting in 2003 the stock status for most districts improved with good recruitment and the GHL was raised to 2,600 tons. The positive stock status trend continued in 2004, with a 2,850 tons GHL and in 2005 with a 3,475 tons GHL (Gretsch 2005a; Table 2).

Harvest Strategy

Overall, the regulatory effect of the developmental phase of the fishery (1977 to 1982) was the emergence of a relatively stable herring sac roe fishery through 1991. Two strong year classes, from the 1987 and 1988 brood years, resulted in a dramatic biomass increase of some stocks and record to near-record harvests in the 1992 through 1995 seasons, when catches ranged between 4,283 (1992) to 5,893 tons (1994; Table 2). The increase in herring abundance occurred during years of

high prices and fishery participation grew. With the crash in prices, followed by herring stock declines, gillnet permit holders had little harvest opportunity when competing against purse seine permit holders and they promoted a change in fishery management.

An allocative harvest strategy was developed through the efforts of an Alaska Board of Fisheries (BOF) Herring Task Force (established in 1999) that consisted of purse seine and gillnet permit holders, and the Alaska Department of Fish and Game (ADF&G) staff. The task force developed a harvest strategy that provides opportunity for gillnet permit holders to harvest approximately 25% and purse seine permit holders to harvest approximately 75% of the total preseason GHL for the management area (5 AAC 27.535).

The harvest strategy requires the department to establish GHLS by section, based on historical harvest data, current and past fishery performance, commercial catch samples, and aerial biomass surveys. The department is then required, for each district that has more than one section open to fishing, to assign, by section, 20% to 30% of the GHL to gillnet permit holders and 70% to 80% of the GHL to purse seine permit holders.

During the 2002 BOF meeting only one change was made to the allocative harvest strategy. That change combined the three Afognak Districts, treating them as one district, for allocation purposes (5 AAC 27.535(e)(2)(c)(ii)).

During the 2005 BOF meeting several changes were made to the allocative harvest strategy. One allowed the department to combine adjacent sections within a district and manage them as a single unit when information indicates that one stock of herring is being harvested. The plan was also changed so that purse seine and gillnet gear be allowed to fish the same section in order to achieve the allocation percentages within a district. Changes also direct the department to manage the fishery to achieve the highest level of product quality; previous regulations directed fishery management without regard for herring roe quality. Lastly, there was a conservation provision in the plan concerning section harvest overages being applied to a district GHL, which established district GHLS; that provision was eliminated from the plan.

FISHERY MANAGEMENT

Districts and Management Sections

Currently, the KMA is divided into 13 districts which define geographical areas used in managing both the herring sac roe and food and bait fisheries (Table 3; Figure 4). For the sac roe fishery, each district is divided into sections that are intended to define the spawning area used by herring stock or define a geographical area. There are a total of 82 sections (Table 3).

GHIL Criteria

Preseason GHLS are established for all sections that have produced consistent herring harvests in previous seasons. These GHLS reflect the status of a particular herring stock by section. The section GHLS ranged from 10 up to 1,450 tons in 2005. Criteria for establishing the 2005 GHLS involved evaluation of a variety of information to determine stock status trends and conservative adjustment of GHLS, including: 1) fishery performance during preceding season or seasons (i.e., harvest timing, harvest duration, average school size); 2) trends in age composition (i.e., level of recruitment of age-3 herring, the proportion of age-5 and younger herring, and the proportion of age-2 herring as an indicator of future recruit strength); 3) observations of spawn and juvenile herring; 4) industry and department aerial surveys; 5) hydroacoustic surveys; 6) test fishery data including age composition and biomass estimates; and 7) aged-structured analysis (ASA)

modeling. Preseason GHGs have generally reflected the actual harvests (Figure 5) and have aided fishermen and processors in planning prior to the start of each season.

Fishery Characteristics

The KMA herring sac roe fishery currently occurs in approximately 30 bays and coastal locations. The fishery opens at noon on April 15, with most of the management area opening concurrently. Historically this opening, prior to any major buildup of herring, was intended to distribute effort and harvest; however, during the last 8 years purse seine fishermen have concentrated in areas known to have early spawning herring and the largest GHGs. With the allocation plan in effect since 2000, the department has used emergency orders to adjust fishing time if overharvest concerns exist when managing the fisheries. Several sections that are known to have later spawning and larger stocks were also opened at a later date when the department was available to monitor the fishery.

To reduce operational costs and to cover more areas, many purse seine fishermen form combines of 2 to 10 permit holders. These combines usually include one or more tenders and spotter aircraft. Light airplanes have been a very productive way to locate harvestable herring and to direct seine fishermen to those locations.

Gillnet permit holders generally work independently and deliver their fish directly to the processor. A few gillnet fishermen are equipped with scanning sonar but the majority use color down-sounding sonar to locate herring schools.

The department historically relied on the fishing industry to establish roe recovery and minimum size standards. The quality of Kodiak herring is generally high, due to careful selective harvest of mature herring by fishermen and the inseason processing of relatively small amounts of herring over long time periods by local processors. In the 1990s competition in the purse seine fishery intensified and fishermen were less selective in harvesting high quality herring. In 2003 and 2004 the department took a more active role in some sections to manage for roe quality, which resulted in delayed openings of sections and an increase in roe quality. During the 2005 BOF meeting, the harvest strategy was changed so that the department is now directed to strive for the highest level of product quality (5 AAC 27.535.(e)(6)).

Fishery Monitoring

This fishery is primarily monitored on the fishing grounds by department management personnel stationed aboard state vessels or at shorebased tent/cabin field camps. The field crews are stationed in areas that have historically produced the largest harvests. These field crews are positioned in remote bays by chartered floatplanes or vessel and are equipped with an inflatable raft or skiff. Daily contact with fishermen, spotters, and tender operators is maintained in order to acquire fishery data. The department receives reports from field personnel several times daily that included current harvests, effort levels, and fleet movements. Information is reported by single side band (SSB) radio or satellite phone systems. The use of field personnel has been a key element in supporting this fishery's harvest strategy and preventing excessive harvests. Field personnel also identify herring spawning areas and collect age-weight-length (AWL) samples from the commercial harvest. Department aerial surveillance of the entire area supplements fishery monitoring and often directs the placement of field personnel.

Inseason Fishery Management

Processors and independent tender operators are required to provide daily tallies of herring deliveries by section, as well as accurate estimates of herring onboard tenders that have not yet delivered to the processor. The department tallies reports from field personnel, processors, and

tenders, to assess herring harvests. Generally, once the harvest estimate meets or approaches the GHL, a section is closed for the season by emergency order. Due to the rapid pace at which some harvests occur, inperiod closures are frequent. In sections that have field personnel present on the grounds, inperiod closures may occur with only a few minutes of advance notice.

Timely and accurate harvest reports, from department field personnel, permit holders, spotter pilots, and processors, are critical for assessing herring harvests and managing the fishery. To date, industry cooperation has greatly aided managers.

Enforcement Issues

The Alaska Department of Public Safety, (DPS), provides enforcement coverage of the KMA herring fishery during the first two weeks of the season when effort levels are the greatest. The DPS utilized a vessel and an aircraft to monitor the 2005 fishery and worked closely with the department.

The presence of DPS greatly reduces the enforcement burden on department field crews, especially during openings, closures, and in situations where emergency order lines or section boundaries need to be identified. During the season, the majority of enforcement problems concern purse seine sets that are made early (prior to opening times) or late (after the closure time). With the allocative harvest strategy in effect since 2000, gear conflicts on the grounds, though minor in the past, are now non-existent.

2005 Pre Season Fishery Meeting

The department held a preseason fishery meeting with permit holders and processors in Kodiak on March 2, 2005. This meeting reviewed the GHLs by section, gear section assignments, and new regulations for the 2005 season. There was also a discussion on fishery management options for the 2005 season. The goal of this meeting was to allow permit holders and processors to have input in how the department manages the fishery. For the 2005 season, based on BOF regulation changes, the department was allowed to combine adjacent sections and manage them as one when it appears that one stock of herring is being harvested. Four areas were identified that the department would combine sections in 2005 (Gretsch 2005a). All present at the meeting were supportive of the department combined sections.

The most controversial topic discussed was how the department would manage the fishery in those sections where both gear types have an allocation. No consensus was reached with the permit holders on how this would be accomplished, although the department supported alternating days of fishing between the gear types. Only two areas would be affected for the 2005 fishery. The department suggested that purse seine gear would be allowed to fish first once good quality herring were found with test sets. The following day after the purse seiners had commercially fished the gillnet permit holders would be given separate fishing time and area.

Processors were concerned for product quality and capacity if a large harvest were to occur. They suggested the department try to avoid situations where large amounts of herring are caught at one time. Permit holders were also supportive of restricting the daily harvest to ensure product quality; the department determined that in 2005 daily harvest limits would be approximately 400-500 tons for all districts.

2005 SEASON SUMMARY

The 2005 sac roe season opened at 12:00 noon April 15 and 50 emergency orders concerning this fishery were issued during the season (Appendix A1.). The last harvest occurred on May 21,

(Figure 6) though most processors had stopped buying herring by May 15. The total 2005 KMA GHL was 3,475 tons (Tables 2 and 3; Gretsches 2005a). The 2005 harvest was 3,463 tons and was the fifth largest harvest since 1964 (Tables 1-3).

From 2001 to 2005 the annual GHL averaged 2,465 tons and from 1996 to 2005 averaged 2,520 tons (Table 2). The GHL has ranged from 1,495 tons in 1999 to 4,550 tons in 1994. From 2001 to 2005 the annual harvest has averaged 2,399 tons and from 1996 to 2005 averaged 2,369 tons (Figure 2). The harvest has ranged from 1,370 tons in 2000 to 5,893 tons in 1994 (Tables 1 and 2).

In 2005, a total of 44 permit holders made 195 deliveries during the season, with 32 purse seine fishermen harvesting 3,463 tons and 12 gillnet fishermen harvesting 531 tons (Table 2). Purse seine fishermen harvested 85% and gillnet fishermen 15% of the total KMA harvest in 2005 (Table 2; Figure 7). The average purse seine permit holder harvested 92 tons, the third highest average harvest in the past 27 years. The average gillnet permit holder harvested 44 tons, also the highest average harvest in the last 27 years, topping the previous record of 31 tons by 30% (Table 2). A total of 26 tenders were registered to transport herring to processors. There were four companies operating five shore-based processing facilities that were registered to buy and process herring.

The 2005 fishery was monitored by two ADF&G shore-based field crews and two department vessels, which were stationed in anticipated herring harvest locations. Crews gathered effort and harvest data used to manage the fishery, and collected commercial catch samples to obtain age, weight, and length (AWL) data. The department conducted a herring test fishery program, which harvested 95 tons of herring. The proceeds from this test fishery were used to assist department fishery management and research programs.

There were a total of 43 sections open to fishing; however 18 sections were exploratory having little or no historic harvests (Table 3). Harvests occurred within 25 sections, 15 sections were not fished, and the remaining 4 sections were fished with no harvest. The Paramanof/Foul Bay Sections in the West Afognak District did not open as scheduled due to low abundance of spawning biomass. The bulk of the sections that were not fished were within the Mainland Districts.

Purse Seine Fishery

The department managed certain sections of the purse seine fishery differently within the KMA in 2005 based on BOF regulation changes, the size of the GHLS, anticipated effort levels, and the spawn timing of the different stocks (Gretsches 2005a). The majority of the department's efforts are spent on managing the purse seine fishery due to the harvest power of the purse seine fleet versus the smaller less efficient gillnet fleet. The 2004/2005 over winter climatic conditions were mild and it was anticipated by the department and the permit holders that high quality roe herring would be available to harvest when the fishery opened in the known early spawning locations in the KMA on April 15. This speculation on early spawning time was true with ripe herring being found in most purse seine sections on April 15.

The largest herring biomass in the KMA is found in the vicinity of Village Islands in the Uganik District (Figure 4). For the 2005 fishery in the Uganik District the department combined the Village Islands (UG 30), Northeast Arm Uganik (UG32), East Arm Uganik (UG 33), and South Arm Uganik (UG 34) sections. Collectively these sections were referred to as the Village Islands/Uganik Bay Sections and the total purse seine GHL for the combined sections was 1,200

tons and the total gillnet GHL was 250 tons (Table 3). In order to properly allocate herring within the Uganik District, both purse seine and gillnet gear were allowed to fish within these combined sections on alternating days. All permit holders were informed in the harvest strategy that the department would start gillnet fishing periods on the first even day of the month after the initial fishing period for purse seine gear was allowed. The alternating days of fishing eliminated any gear conflicts and provided department staff time to assess catches. This allowed permit holders that caught fish an opportunity to deliver their own catches to the processor in Kodiak gaining extra value for their herring by not having to pay tender fees. The department also managed this fishery to enhance the value of the landed product and control the harvest rates. This was accomplished by conducting roe testing prior to any fishing, limiting the fishery to short openings, and opening only a portion of the Village Islands/Uganik Bay Sections. Although the department could have opened any part of the Village Islands/Uganik Bay Sections, all fishing in 2005 occurred in the Village Islands Section. The department vessel R/V K-Hi-C was used to conduct hydro acoustic surveys and accommodate department research and management staff.

On April 15 the department started a daily testing program to assess roe quality and the size of herring present. The goal was to target the harvest on fish with at least 11% roe and a minimum average size of 130 to 140 g. Initial roe testing indicated the herring congregated near Village Islands were composed of 9 to 10.5% roe recovery and weighed, on average, about 170 g. These initial samples were near the desired 11% roe recovery; however, a high number of males within the samples (60%) drove the roe percentage down. Sampling resumed in the late afternoon of April 15 in the northern portion of Village Islands and herring samples collected averaged 11% roe recovery and 205 g. Only 13 purse seine vessels were present in the Uganik District with the remainder of the purse seine fleet distributing in the Eastside and Afognak Districts. With the small fleet present, a three hour fishing period was announced starting at 5:00 p.m. Meanwhile, in the Eastside District, herring were also being harvested to the extent that it appeared that the processing capacity would be exceeded. The initial three hour fishing period in a portion of the Village Islands was curtailed at 6:45 p.m. with an emergency order (EO) closure and the harvest was approximately 450 tons. A small spawn occurred during the night of April 15. The first gillnet fishing period began on the morning of April 16 and this alternating schedule was maintained until one of the gear types caught their respective GHLS.

On April 17 test fishing began in the afternoon and initial sampling near Green Island found small 135 g immature herring. Sampling resumed in the late afternoon and samples improved with 160 g herring at nearly 12% roe recovery. Effort levels increased to 15 purse seiners. Three EO openings near Village Islands occurred from 4:00 p.m. through 7:30 p.m. (3.5 hours open) and approximately 170 tons were harvested bringing the total seine harvest to 600 tons. During these three purse seine openings and subsequent openings the herring were found to be quite difficult to catch, generally diving below the net before it could be pursed, unlike fish behavior seen in previous years in this section.

On April 19 the test fishing program was continued and four samples revealed herring that ranged from 170 to 190 grams in weight and had a roe recovery of 10.5% to 13.5%. Due to section closures in the Eastside District vessels moved to the Uganik District and effort levels increased to 27 purse seiners. With the increase in purse seiners, a reduced GHL remaining (600 tons), and a large herring biomass, the department was more conservative in managing the fishery. Four EO openings occurred from 2:05 p.m. through 7:00 p.m. (3.3 hours) but only 95

tons were harvested bringing the total seine harvest to 700 tons. The increase in purse seiners made the herring more difficult to catch due to the extra vessel activity.

On April 21 no test fishing was conducted since sampling on April 19 indicated most herring near Village Islands were marketable, and schools of herring out in the middle of Uganik Bay were composed of younger immature herring. Stormy weather conditions prevailed through the day but there were four openings from 10:50 a.m. through 2:50 p.m. (4 hours open) near the southern boundary line of the Village Islands Section and 175 tons were harvested by 28 purse seiners. There was additional fishing near Village Islands with three openings from 4:00 p.m. through 7:00 p.m. (3 hours open) but only 10 tons were harvested, bringing the total harvest to 885 tons. Processors reported that the herring caught near the southern boundary of Village Islands averaged only 9% roe recovery. Several purse seine vessels left the district and headed to the Uyak District or to the Togiak herring fishery in Bristol Bay.

On April 23 the test fishing program was resumed and initial samples consisted of small and immature herring at 3.5% roe recovery. Additional sampling occurred to the north of Village Islands that found herring that ranged from 195 to 220 g and 12.5% to 13.5% roe recovery. Four fishing periods occurred from 4:15 p.m. to 8:15 p.m. (4 hours open) but again the herring were quite difficult to catch for the 19 purse seiners present and 105 tons were harvested, bringing the total harvest to 990 tons. Several more purse seiners left for Togiak after this opening.

On April 25 there were only 13 purse seiners remaining and no test fishing was conducted though permit holders were advised to check the roe recovery of their catches. Three fishing periods occurred from 1:30 p.m. through 6:50 p.m. (3 hours open) and approximately 325 tons were harvested, bringing the total harvest to 1,311 tons and the GHL was 1,200 tons (Table 3). Roe recovery samples from the last opening ranged from 10.7% to 10.9%. The average roe recovery from all purse seine deliveries averaged 10.7%.

The Paramanof (WA 31) and Foul Bay (WA 32) sections in the West Afognak District were sections that were also combined and managed as one section (Table 3). These sections were also were intended to be managed for roe quality and fish size. Generally these sections are some of the first in the KMA to have ripe herring present on April 15. The department vessel R/V Resolution was used to conduct hydroacoustic surveys within the West Afognak District starting on April 14. Extensive hydroacoustic and aerial surveys by the department and industry on April 14 through April 16 found insufficient amounts of herring to justify a fishery. The department and industry conducted aerial and hydroacoustic surveys through mid-May and only a few herring schools were observed and the amount of herring observed remained insufficient to have a fishery. Two exploratory sections in the North Afognak District had purse seine harvests in May; the Tonki Bay Section had a 16 ton harvest and the Perenosa Bay Section had a 7 ton harvest (Table 3).

With the lack of herring in the Paramanof Bay Section, the department vessel R/V Resolution was moved to the Uyak District (Figure 4) to manage the fishery in the Inner Uyak Bay Section (UY 30). The Uyak District remained closed until a department vessel and staff were available to manage the fishery. Permit holders were also informed that there would be 24 hours advanced notice prior to fishing to give equally opportunity to participate in the fishery. In order to properly allocate herring within the Uyak District to achieve the 75% purse seine and 25% gillnet allocation by district, both purse seine and gillnet gear were allowed to fish within the Inner Uyak Bay Section on alternating days. For the Inner Uyak Bay Section there was a 250 ton

GHL for purse seine gear and a 50 ton GHL for gillnet gear (Table 3). The Inner Uyak Bay Section was also managed for roe quality and purse seine gear would be given the first opportunity to fish once the desired quality of herring were found. The department also tried to coordinate openings in the Inner Uyak Bay Section and in the Village Islands/Uganik Sections to distribute the purse seine fleet. There were three fishing periods through the afternoon of April 17, the first two periods were short 10 and 20 minutes in duration and the herring proved to be difficult to catch with only 27 tons harvested by 10 purse seiners. The third fishing period was announced for 3 hours in duration, however catch rates improved from the earlier openings and the period had to be closed after 69 minutes of fishing with a total harvest of 406 tons. Roe recovery averaged 11.1%. There were no other purse seine fisheries in the Uyak District and vessels moved back to the Uganik District after the Inner Uyak Bay Section was closed.

In the Eastside District (Figure 4) early spawning herring can be found in the vicinity of Sitkalidak Strait in late March. There was no roe testing program for the Eastside District and purse seiners were assured an opportunity to fish starting on April 15. There were 12 purse seiners present and the department had a shore based field crew stationed in Amee Bay in the East Sitkalidak Strait Section (EA 30). Fishing started in the East Sitkalidak Strait Section in Amee Bay where 106 tons were harvested (GHL of 100 tons; Table 3) and this section was closed at 1:25 p.m. on April 15; roe recovery from the harvest averaged 11.6%. The purse seiners then moved to the nearby Barling Bay (EA 24) and West Sitkalidak (EA 23) sections. In the Barling Bay Section 136 tons were harvested (GHL 75 tons; Table 3) and this section closed at 3:30 p.m. on April 15, roe recovery was 11.0%. In the adjacent West Sitkalidak Strait Section 173 tons were harvested (GHL 125 tons; Table 3) and this section closed at 6:30 p.m. April 15, roe recovery was 11.3%. Most of the purse seiners moved over to the westside fisheries and the department field crew moved to the Inner Uyak Bay (EA 51) Section. The Inner Uyak Bay Section fishery began on April 19 and on April 25 the section was closed with a harvest of 167 tons (GHL 150 tons; Table 3); roe recovery was at 10.7%. The department had a second field crew stationed in Kiluida Bay and the crew reported herring spawn beginning on April 19; however, fishing did not begin in this section until April 26, with 3 to 10 purse seiners participating. The Outer Kiluida Bay (EA 43) Section was closed on May 7 and the harvest totaled 247 tons (GHL 200 tons; Table 3); roe recovery was 10.9%.

In the Alitak District (Figure 4) the herring stocks have steadily improved in abundance during the last three years. Purse seine effort is generally fairly low for this district since the timing of Alitak District fisheries generally occurs in May when the bulk of the seine fleet is in Togiak and is restricted by the market. A land based processing facility operated by Ocean Beauty Seafoods Incorporated (OBSI) is the only market for these herring and the company only buys from their permit holders. The department stationed a field crew at the OBSI plant in late April and the department vessel R/V K-Hi-C also was in the district in early May to monitor the fishery and conduct hydro acoustic surveys for herring. The purse seine fishery started on April 27 with a harvest from the Inner Deadman Bay Section (AL 21) and this section was closed on May 2 with a total harvest of 103 tons (GHL 75 tons; Table 3); roe recovery averaged 9.3%. The Outer Deadman Bay (AL 22) Section was fished next and it was closed the following day on May 3 with 82 tons harvested (75 ton GHL; Table 3); roe recovery was at 8.8%. The North Olga Bay (AL 41) Section, an exploratory section, had a 36 ton harvest and was closed on May 4; roe recovery was 6.5%. The adjacent Upper Olga Bay section was fished; however, the roe recovery quality was poor and no herring were harvested. Lastly, the Inner Alitak (AL 20) and Portage

Bay (AL 31) sections were combined and 98 tons were harvested (75 ton GHL; Table 3) and this section was closed on May 7; roe recovery was 9.7%.

In the Inner Marmot District (Figure 4), only the Kizhuyak Bay (IM 40) Section was open to purse seining. There was a 44 ton harvest (GHL 50 tons; Table 3) and this section was closed on April 18; roe recovery from this harvest was 10.0%. There were no other purse seine harvests in the KMA. Fishermen expressed interest in fishing the Mainland District as they returned from the Togiak fishery in mid-May but there was no effort. Processors ceased buying herring on May 26.

Gillnet Fishery

All sections that were designated for the gillnet fishery opened on April 15, except the Village Islands/Uganik Bay Sections and the Inner Uyak Bay Section. These sections were designated EO fisheries and both gear types were utilized.

In the Uganik District, for the combined Village Islands\Uganik Bay Sections, there was a 250 ton GHL for gillnet gear (Table 3). The first gillnet fishing period started at noon April 16 and closed at 9:00 a.m. April 17. Subsequent fishing periods started at 9:00 a.m. on even numbered days in April and closed the following odd day at 9:00 a.m. The first fishing period on April 16 had three vessels, but no catch as the herring stayed deep and just offshore of Village Islands. The second fishing period on April 18 saw effort levels increase to eight boats and 45 tons were harvested at 11.1% roe recovery. The third opening on April 20 had nine boats, which harvested 80 tons at 10.5% roe recovery. The fourth opening on April 22 with seven boats, had no catch as the herring stayed deep and offshore from Village Islands. The fifth opening on April 24 with nine boats, resulted in 50 tons being harvested and roe recovery dropped to 9.5% due to high male percentages in the catch. The total harvest through the April 24 opening was 175 tons. A sixth opening on April 26 with nine vessels was closed by EO at 12:01 a.m. Catch rates were excellent and 78 tons were harvested bringing the total harvest to 253 tons. Roe recovery for the last opening was excellent at 10.7%, and with all deliveries combined, averaged 10.5% for the season. There were three other sections in the Uganik District that were open exclusively to gillnet gear in 2005 and all remained open from April 15 through June 30 with the regulatory 24 hour fishing periods. In the Viekoda Bay Section only 3 tons (25 ton GHL; Table 3) were harvested with 9.6% roe recovery. In the Terror Bay Section 29 tons were harvested (30 ton GHL; Table 3) and roe recovery averaged 11.3%. Lastly, in the West Uganik Passage Section 18 tons were harvested (60 ton GHL; Table 3) and roe recovery averaged 11.3%.

In the Uyak District, the Inner Uyak Bay Section was opened to gillnetting after the purse seiners had caught their entire GHL and more on April 17. The first gillnet period was open 24 hours starting April 18 at noon though no boats were present. All subsequent openings for this section were the standard gillnet fishing periods of 24 hours open followed by 24 hour closures beginning April 21 at noon. Less than one ton was harvested by the gillnet permit holders in this section. There were two sections also open exclusively for gillnetters in the Uyak District. The Zachar Bay Section (UY 40) had a harvest of 25 tons (GHL 20 tons; Table 3), roe recovery was at 9.0%, and the section was closed on May 12.

In the Afognak Districts there were three sections that were open exclusively for gillnet permit holders with GHLs. The Danger Bay Section (SA 40) had a harvest of 47 tons (GHL 70 tons; Table 3) and roe recovery was 9.6%. This section in recent years has been a strong producer for the gillnet fleet; however, in 2005 early spawning may have occurred explaining the lack of

production. The department combined three sections in the South Afognak District including the Kitoi Bay (SA 20), McDonalds Lagoon (SA 30), and Izhut Bay (SA 10) sections and opened them with a 15 ton GHJ (Table 3). The harvest from these three sections was 36 tons and roe recovery averaged 12.0%. The Malina Bay Section (WA 20) was also open to gillnet gear with a 10 ton GHJ (Table 3); however, no fishing occurred there.

All three Eastside District sections were opened exclusively to gillnet gear and all were fished. The Shearwater Bay Section (EA 42) was the most productive with 37 tons harvested (GHJ 30 tons; Table 3); this section was closed on May 10, and the roe recovery averaged 10.3%. The Outer Ugak Bay Section (EA 50) had a harvest of 28 tons (GHJ 100 tons; Table 3) and roe recovery averaged 8.3%. The Inner Kiliuda Bay Section (EA 44) had a harvest of 15 tons (GHJ 75 tons) and roe recovery averaged 9.9%. Lastly, for the Southwest Sitkalidak Section (EA 20), an exploratory section, 8 tons (Table 3) were harvested and roe recovery was 12.4%.

In the Northeast District only the Womens Bay Section (NE 10) was open to fishing and 25 tons were harvested (20 ton GHJ; Table 3) and roe recovery averaged 11.0%.

In the Alitak District one section was open exclusively for gillnet gear. Several gillnet permit holders fished the Sulua Bay Section (AL 30) and also looked for herring in the two exploratory sections of Olga Bay; however, no herring were harvested.

Exvessel Value of the Fishery

The price paid for 10% roe recovery herring was approximately \$500 per ton at the dock. Roe recovery from this year's fishery averaged 10.6% for purse seine permit holders and 10.5% for gillnet permit holders. The estimated average exvessel earnings for purse seine permit holders was \$45,800 and for gillnet permit holders was \$22,100 (Figure 8). The total exvessel value of the 2005 fishery was an estimated \$1,731,000 and does not include any adjustments in value for roe recovery above or below 10% recovery, herring that are sold as bait, or herring that were discarded (Figure 9).

CATCH SAMPLING

A total of 2,334 herring were collected for AWL data from purse seine harvests, representing ten of the fourteen sections that had a harvest in 2005 (Table 4). These ten sections accounted for 94% of the total KMA purse seine harvest. Age-4 herring were the dominant age class harvested in the 2005 season, representing an estimated 32.7% of the total purse seine harvest (Table 4). The remaining age classes represented the following percentage of the purse seine harvest: 4.8 % age-3, 12.3% age-5, 21.5% age-6, 6.2% age-7, 13.4% age-8, 1.5% age-9, and age-10 and older combined for 7.2%.

A total of 198 herring were collected for AWL data from the gillnet harvests, representing four of the ten sections that had a harvest in 2004 (Table 5). The four sections accounted for 80% of the total KMA gillnet harvest. Age-6 herring were also the dominant age class harvested representing 39.3% of the gillnet harvest (Table 5). The remaining age classes represented the following percentage of the gillnet harvest: 15.6% age-4, 19.7% age-5, 8.8% age-7, 13.2% age-8, age-10 and older combined for 3.1%.

Generally, the herring from Alitak and the eastside of Kodiak Island (Eastside District) were larger at age than those found on the west side of Kodiak and Afognak Islands (Uganik and West Afognak Districts; Tables 6 and 7). Weight-at-age of the younger age classes in 2005 were similar to those observed in recent years (Gretsch 2005b).

STOCK ASSESSMENT

The department evaluates fishery performance and survey information to assess trends in stock status. Hydroacoustic and aerial surveys, conducted by commercial fisheries biologists, are utilized to assess herring abundance prior to, during, and after the commercial fishery and to survey closed sections. ADF&G research vessels are also used to collect herring samples by trawl, gillnet, and jig gear. Age composition information from these samples gives the department insights into recruitment trends and helps guide adjusting GHGs. For example, areas with strong percentages of age-3 herring or age-4 will not be aggressively fished and will have conservative GHGs, while other areas with older age classes (9 or more years old) will be more aggressively fished with increasing GHGs.

Industry spotters and permit holders have aided managers by providing biomass estimates, spawn observations, fleet movements, and harvest estimates. These spotter pilots are very experienced and have been involved for several seasons in the KMA and other statewide herring fisheries. The department has also received assistance from air charter pilots with herring and spawn observations.

The results of aerial and hydroacoustic assessments can provide a limited evaluation of the total biomass. Problems associated with herring assessment in the KMA include: 1) herring tend to be near the surface, and hence more visible, during the evening and early morning hours, which limits the time fish are observable from the air; 2) most fishing sections have several distinct schools of herring that spawn from April through June; 3) herring may stay within an area for the duration of the sac roe season or may move to another district, which may lead to duplicated or incomplete biomass estimates, or incorrect assignment to a spawning stock location; 4) the KMA encompasses a large geographical area (82 sections); and 5) adverse weather conditions. Hydroacoustic surveys are also limited in shallower waters, and the extent of herring avoidance to vessel noise is unknown. There also appears to be a significant amount of subtidal spawning, occurring in water 10 to 20 fathoms in depth, which is not detectable from aerial surveys.

Due to the low gillnet effort since 1998 it is difficult to use fishery performance as an indicator of stock status within the gillnet sections. Catch samples collected in 2005, though small in number, are still considered a good representation of the harvest.

STOCK STATUS BY DISTRICT

The following is a review of stock status as indicated by recent fishery performance, age composition data, recruitment trends, and survey data by district. Herring can generally be found seasonally in all bays of the KMA (Figure 4). The department currently monitors approximately 70 sections that are known to have spawning populations of herring. Management biologists rely on fishery performance and catch samples to evaluate trends in stock status. The majority of the department's assessment efforts target larger herring stocks. Generally, there is less information available for the smaller stocks of herring so the evaluation of these stocks is more tenuous. In some cases, such as sections of the Mainland District, several years may elapse before new information becomes available. The department also considers information provided by commercial herring fishermen and spotters, air taxi operators, and remote area residents, concerning herring distribution, biomass estimates, and spawn sightings, when determining stock status.

West Afognak District

There are six sections in the West Afognak District, and five have spawning stocks of herring (Figure 4). Paramanof Bay has the largest spawning stock within this district, though this stock was at a low

biomass level in 2005. The Paramanof Bay fishery was cancelled in 2005 as the observed biomass was assessed to be from 300 to 500 tons. Harvests in this section from 2000 to 2004 have ranged from 223 to 614 tons (Gretsch 2005b). In the early 1990s the GHLS for the Paramanof and Foul Bays totaled 60 to 70 tons, was increased through 1997, and peaked at 700 tons. The large increase in this herring stock and associated harvests in the late 1990s were related to a very strong 1988 brood year. Since 1999 the department has maintained GHLS in the 225 to 350 ton range for this section since the spawning biomass of the older age classes has declined. Large spawns have occurred annually from 1994 through 2003, although no strong recruitment event has occurred. Age compositions from 2004 commercial catch samples showed the dominant age classes were age-7 (29.1%), age-5 (23.4%), and age-6 (12.8%; Gretsch 2005b). Age-3 (recruit) herring represented 4.7% of the 2004 harvest. Overall, this stock of herring has decreased from the high levels that occurred from 1994 through 2001, but is still relatively large when compared to the fisheries that occurred in the late 1980s and early 1990s.

The Foul Bay Section (WA 32) is adjacent to the Paramanof Bay Section (WA 31; Figure 4). Age compositions and recruitment events tend to be similar, though the Foul Bay spawning stock is much smaller. Foul Bay was designated as a gillnet section from 2000 through 2002 and a purse seine section in 2003 and 2004 (Gretsch 2005b). Age compositions from the 2002 gillnet fishery consisted primarily of age-5 (60.1%) and age-9 (10.5%) herring, with a mix of other age classes (Gretsch 2003b). There was no harvest from the Foul Bay Section in 2003 or 2004 due to the seine harvest in Paramanof Bay exceeding the district GHL. Starting in 2004, Foul Bay was included with Paramanof Bay for fishery management purposes since it appeared likely that the same stock of herring were found moving between the two areas.

The Malina Bay Section (WA 20; Figure 4) was closed to commercial fishing from 1997 through 2000 (Gretsch 2001b). Aerial and hydroacoustic surveys from 1998 to 2005 have indicated that 100 to 200 tons of herring have been present annually. This section was opened to gillnet gear in 2001 through 2005, with a GHL of 10 to 20 tons. Small harvests occurred in 2002 (0.5 tons) and 2003 (1.5 tons). However, few permit holders participated or spent a significant amount of time fishing this section. In both 2002 and 2003 this section was closed due to excessive gillnet harvests in the Danger Bay Section that resulted in a district closure of the Afognak Districts. With the lack of fishing effort the department has little fishery performance information to help evaluate the stock status. Age compositions from 2002 Malina Bay Section commercial catch samples show the predominant age classes were age-5 (27.5%), age-8 (13.7%), and age-9 (13.7%; Gretsch 2003b).

The Raspberry Strait Section (WA 10; Figure 4) was open to gillnet gear in 2001 after being closed since 1997 (Gretsch 2003b). Less than one ton was harvested and hydroacoustic surveys in April 2001 indicated low herring abundance. This section was closed for the 2002 through 2005 seasons, and spring hydroacoustic surveys in 2002 through 2004 indicated continued low herring abundance.

North Afognak District

Five sections compose the North Afognak District (Figure 4). Spawning stocks of herring occur in all five sections though these stocks tend to be small (less than 20 tons). Historically, small harvests have come from all five sections. The Perenosa Bay Section (NA 30) had the largest spawning stock and declines in stock abundance prompted the department to close three sections to herring fishing in 1995, and a fourth section was closed in 1998. In 2004 the Perenosa Bay Section was opened as a test fishery and was designated as exploratory, although no harvest occurred. In 2005 the Perenosa Bay Section was again open as exploratory and seven tons were harvested, the roe quality was poor, and no samples were obtained. Due to occasional aerial

observation of small herring schools, the Tonki Bay Section (NA 50) was opened to commercial fishing in 1998. However, since 1998 fishery participation has been low and no catch occurred 1998 through 2001 when the section was open to gillnet gear only, no catch in 2002 when it was open to seine gear, and no catch in 2003 when it was open to gillnet gear. In 2004 the Tonki Bay Section was designated exploratory and 43 tons were harvested by purse seine gear. Age compositions from the commercial catch samples indicated the predominant age classes were age-3 (30.6%), age-6 (18.2%), age-5 (17.5%), and age-4 (14.5%; Gretsich 2005b). The age compositions from the 2004 harvest indicates good recruitment and multiple good spawns have occurred with the age classes found. In 2005 the Tonki Bay Section was opened again as exploratory in 2005 and 16 tons were harvested by seine gear no samples were collected.

South Afognak District

The South Afognak District comprises six sections (Figure 4). The Danger Bay Section (SA 40) was open to gillnet fishing during the 2001 through 2005 seasons. In 2003 through 2005 the Izhut Bay Section was also open to gillnet fishing. In 2005 the McDonalds Lagoon and Kitoi Bay Sections were opened to gillnet gear. The remaining South Afognak sections have been closed since 1995. Aerial and hydroacoustic surveys in recent years have shown a steady increase of herring biomass in Danger Bay. An observed increase in the Danger Bay stock prompted the department to open this section to gillnet gear in 2001, with a small, 15 ton GHL and 20 tons were harvested. The department increased the GHL in 2002 (30 tons, harvest of 88 tons), increased in 2003 (50 tons, harvest 91 tons), increased in 2004 (70 tons, harvest 74 tons), and in 2005 (70 tons and a harvest of 47 tons). Fishery performance in 2005 was down due to early spawning and marketable herring were not available for harvest after the initial openings. Age compositions from 2005 Danger Bay Section commercial catch samples indicated that the predominant age classes were age-4 (48.6%), age-5 (30.2%), and age-6 (15.7%, Table 5). No post fishery hydroacoustic survey was conducted by the department in 2005, however gillnet permit holders commented that good numbers of herring were present.

For the Izhut Bay Section (SA 10), the department received several reports from cod fishermen that indicated a sizeable herring biomass was present in the spring (March to April), and this section was opened in 2003 and 2004 to gillnet gear with a 10 ton GHL as a test fishery. No gillnetters fished the Izhut Bay Section in 2003 or 2004. In 2005 regulation changes allowed the department to combine sections when one spawning stock was thought to move within multiple sections. For the three combined sections in 2005 a GHL of 15 tons was established with 38 tons being harvested. No samples were collected from the commercial catch and harvests occurred from the McDonalds Lagoon and Izhut Bay Sections. Permit holders who fished these sections indicated that a large biomass was present; however, no department surveys were conducted to confirm these reports.

Uganik District

The Uganik District consists of nine sections on the northwest side of Kodiak Island (Figure 4). During the last 10 years this district has been the most productive in the KMA. The Village Islands Section supports the largest concentration of spawning herring; smaller spawning stocks occur in descending size as follows: South Arm Uganik, West Uganik Passage, Terror, and Viekode Bays. Small spawning stocks are also found in the Northeast Arm Uganik Bay and the East Arm Uganik Bay Sections. Juvenile herring in the spring are found in large concentrations in South Arm Uganik and in Northeast Arm Uganik Bay Sections. The Village Islands spawning stock can move throughout the Uganik Bay complex (five sections) prior to spawning and

historically has been harvested within sections in or adjacent to the Village Islands. Regulation changes in 2005 allowed the department to combine the Village Islands, East Arm Uganik, Northeast Arm Uganik, and South Arm Uganik sections and manage them as one as the Village Island/Uganik Bays Section. Historic commercial catches in these adjacent sections to Village Islands were at times high reflecting the strength of the Village Islands stock and not the strength of stocks in the individual bays adjacent to Village Islands.

Hydroacoustic and aerial survey information indicate that the Village Islands spawning biomass is currently the largest in the KMA. The total biomass of herring observed in the Village Islands/Uganik Bays Section was approximately 30,000 tons in 2005 (herring congregate in Uganik Bay for a month or longer, complicating biomass estimation). This biomass estimate includes all herring of which age-2 and age-3 may comprise 20% to 30% of the total. During the last three years, the department has conducted daily hydroacoustic surveys of the Village Islands Section from approximately April 13 through April 25 and a hydroacoustic survey following the fishery. The Village Islands spawning stock of herring appears to be at record high abundance and appears to be maintaining at a high level. The 2005 GHF for this section was a record 1,450 tons. During the last three herring sac roe seasons a total of 3,428 tons have been harvested and the total GHF was 3,050 tons. Age composition data from the 2005 Village Islands Section commercial sac roe purse seine fishery show the predominant age classes were age-6 (35.8%), age-5 (16.7%), age-4 (14.8%) and age-8 (14.3%; Table 4). Age-3 (recruit) herring were present in 2005 and represented 4.7% of the harvest. The 2003 through 2005 fisheries emphasized harvesting larger and older herring in the Village Islands Section; thus, evaluating recruitment trends based on the sac roe commercial harvest maybe less reliable. A bait herring fishery that occurred in December, 2005, in Northeast Arm was also sampled and consisted of age-2 (10.9%), age-3 (34.4%), age-4 (20.1%), age-5 (16.0%), and age-6+ (17.6%). The age composition of the bait fishery sample would indicate recruitment may be strong for the Village Islands Section in 2006. In 2005, small spawns occurred in the Village Islands from April 15 through early May, and large spawns occurred in early May.

There were three hydroacoustic surveys of the South Arm Uganik Section in mid-April and late April, 2005. During all surveys, many scattered schools of herring were found in the outer portions of the bay and total biomass estimates ranged from 5,000 to 12,000 tons. Jigging on these schools produced small samples that consisted mostly of age-2 and age-3 herring. Herring schools frequently move between the Village Islands and the South Arm Uganik Sections, though spawning mainly occurs in the Village Islands. No commercial fishing occurred in the South Arm Section in 2005, the gillnet fishery allocation was taken from near Village Islands.

The Northeast Arm Uganik and East Arm Uganik sections were not fished in 2005 due to the new regulation changes. There has been very little fishing activity in either section since the 1999 season. A hydroacoustic survey in early April 2004 estimated at least 1,200 to 2,000 tons of herring in the inner portion of the Northeast Arm Section along the south shore. Later surveys found more herring in the outer portions of the bay. Several hydroacoustic surveys were done within the East Arm Uganik Section and at least 400-500 tons of herring were present in the outer portion of the bay from mid to late-April. Small jigged samples from both sections indicated that most of these herring were younger fish (age-2 to age-4).

The West Uganik Passage and was open to gillnet gear in 2005 and 17.9 tons were harvested (60 ton GHF; Table 3). There were no catch samples from the 2005 fishery but age compositions from 2004 commercial gillnet catch samples indicated that the predominant age classes were

age-5 (47.8%), age-7 (23.4%), and age-6 herring (12.9%; Gretsches 2005b). One hydroacoustic survey occurred for this section; however, no herring were observed. Herring sometimes move between the Village Islands and West Uganik Passage Sections. Since this movement isn't annually this section is not combined with the Village Island/Uganik Bay Section.

One hydroacoustic survey of the outer portion of the Terror Bay Section was completed in late April 2005. There were many small scattered schools of herring present in the outer bay that totaled 100 to 200 tons. This section was open to gillnet gear in 2005 and several permit holders fished the section. There was a harvest of 29.3 tons (30 ton GHL; Table 3). No catch samples were collected; however, fishermen reports indicated that catches were made up of 170 gram average weight herring, indicative of age-5 and age-6 herring.

The Viokoda Bay Section was open to gillnet gear in 2005 and 3.0 tons were harvested (25 ton GHL; Table 3). No herring samples were collected, but fishermen reported that their harvest consisted of primarily smaller, younger herring and no hydroacoustic surveys were done.

Uyak District

Through the 1980s, the Uyak District was the largest herring producing district in the KMA (Figure 4). In the early 1990s, harvest data and spotter pilot observations indicated a decline in herring abundance. The department responded to this decline by reducing the GHLs within this district for the 1992 through 1994 seasons, but stocks continued to decline. In 1995 the entire district was closed to fishing, to promote the recovery of these stocks. The department proposed studies to assess the biomass and the age compositions of the herring stocks within this district, but funding has been limited. The Uyak District remained closed to fishing through 2002.

In recent years, both department and contracted vessels have been used to conduct limited hydroacoustic surveys in this area. These surveys indicated the Uyak herring stocks status remained depressed, though the 2000 and 2001 survey results were encouraging especially for the Zachar and Spiridon Bay Sections. No hydroacoustic surveys were conducted in 2003.

Historically, the commercial fishery in the Uyak District took place throughout the month of May, with the Inner Uyak Section fishery occurring in late May. In mid-April 2002, a local air taxi pilot reported seeing a large biomass of herring present in the flats of Uyak Bay and another near Browns Lagoon. A large biomass was again observed in 2003 during mid-April, and confirmed by industry spotter pilots and a department management biologist. The biomass observed was estimated to range from 600 to 2,000 tons. An industry spotter was able to jig a small sample that indicated the fish were ripe adults of mixed age classes (predominately age-6). At least 600 tons of herring were observed spawning within this section in late April. Based on the improvements in stock status in 2002 and in 2003 the department informed purse seine permit holders they may have an opportunity to fish the Inner Uyak Bay Section (UY 30) in 2004 if biomass estimates exceeded 800 tons and sampling indicated that age composition of the herring biomass was older than age-3 (Gretsches 2004a).

The department assessed the biomass within Inner Uyak Bay Section on April 23 and 24, 2004 with both aerial and hydroacoustic surveys. Surveys indicated that between 3,000 and 4,000 tons of herring were present. The department established a 300 ton GHL. Approximately 370 tons were harvested during the commercial fishery. Age compositions from the commercial catch samples indicated that the predominant age classes were age-7 (39.1%), age-5 (28.2%), and age-4 herring (10.3%; Gretsches 2005b). In 2005, the GHL was based on the 2004 fishery performance, age compositions, and aerial surveys assessment. For 2005 the GHL was 300 tons and 406 tons were

harvested by purse seine gear (Table 3). Commercial catch samples were age-6 (28.8%), age-8 (26.6%), age-7 (15.5%), and age-5 (12.7%; Table 4). Aerial and hydroacoustic surveys indicate a similar amount of biomass as observed in 2004 at 3,000 to 4,000 tons.

In 2003, the department opened the Zachar Bay Section (UY 40) to gillnet gear as a test fishery to further evaluate stock status. There was 18.9 tons harvested (15 ton GHL) and age compositions indicated that the predominant age classes were age-6 (50.0%) and age-4 herring (22.6%; Gretsches 2004b). Based on the fishery results in 2003 the department opened the section again in 2004 with a 15 ton GHL. There was 15.6 tons harvested and catch samples indicated that the predominant age classes were age-4 (53.7%), age-5 (22.3%), and age-6 herring (7.4%; Gretsches 2005b). Aerial surveys indicated that 200 to 300 tons of herring were present in late April, but a hydroacoustic survey in late April only found 75 to 100 tons. The 2004 fishery took place in mid-May, several weeks after the surveys were conducted. In 2005 the GHL was increased to 20 tons and 25 tons were harvested by gillnet gear (Table 3). Age compositions were; age-5 (37.0%), age-8 (25.9%), age-6 (18.5%), and age-7 (11.1%, Table 5).

Based on the fishery results in the Zachar Bay Section in 2003 the department opened the Spiridon Bay Section (UY 50) in 2004 with a 15 ton GHL and no harvest occurred (Gretsches 2005b). No herring were observed during aerial surveys and one hydroacoustic survey conducted in late April 2004. The Spiridon Bay Section was closed to fishing in 2005 and department aerial surveys found no herring.

The Browns Lagoon Section (UY 32) was opened in 2005 to gillnet gear as a test fishery with a 10 ton GHL and 8 tons were harvested (Table 3). While no samples were collected of this catch, department aerial surveys indicate that approximately 500-800 tons of herring were present in 2005. The department has received reports of herring concentrations present in the spring in this section since 2002.

In the Larsen Bay Section department aerial surveys found small amounts of herring present in the head of the bay at 10 to 15 tons in April of 2005.

Northeast District

Of the five sections in the Northeast District (Figure 4), four have known spawning stocks of herring. The Womens Bay Section (NE 10) had the largest stock of herring and commercial fishery harvests ranged from 74 to 149 tons from 1990 through 1992 (Gretsches et al 1992, 1993; Prokopowich et al. 1992). Declines in fishery performance from 1995 to 1997 prompted the closure of this district to commercial fishing from 1998 through 2002. This section is near the city of Kodiak and has remained open to subsistence herring fishing, which generally occurred during the winter months. Subsistence fishery regulations became more restrictive in 2001, which resulted in reduced catches in 2001 through 2003 (the harvest decline was not related to a decrease in herring abundance). The remaining sections of the district have small herring stocks and historic harvests have been relatively small and sporadic.

The Womens Bay Section was opened to gillnet gear in 2003 as a test fishery, with a 10 ton GHL. Only one gillnet permit holder fished this section and harvested 7.3 tons of herring (Gretsches 2004b). Age composition from 2003 commercial catch samples show the predominant age classes were age-4 (31.7%), age-5 (30.7%), age-6 (16.3%), and age-10 herring (14.4%, Gretsches 2004b). With the fishery results in 2003, the department increased the GHL for the 2004 season to 20 tons. Two permit holders fished this section in 2004; however, they were late in finding the herring. Most spawned prior to any fishing effort and only 4.5 tons were harvested. Permit holders estimated that

between 150 to 200 tons of herring were observed spawning within the section in early May. In 2005 the GHJ was 20 tons and 25 tons were harvested (Table 3).

Inner Marmot District

There are five sections within the Inner Marmot District (Figure 4) and all have known spawning stocks of herring. From 1990 to 1992 the Kizhuyak Bay Section had the largest stock of herring in the district with commercial harvests ranging from 102 to 117 tons (Gretsch et al 1992, 1993; Prokopowich et al. 1992). Declines in herring abundance occurred from 1993 through 1995, and prompted a closure of the entire district from 1996 through 2001. Aerial surveys have consistently documented herring in this section in recent years, with 400 tons observed in 2003 by an industry spotter.

The Kizhuyak Bay Section (IM 40) was opened to gillnet gear in 2002 as a test fishery, with a 10 ton GHJ that produced 14 tons of herring (Gretsch 2003a). The GHJ was increased to 15 tons in 2003 and 23.4 tons were harvested (Gretsch 2004b). Based on the test fishery results, the Kizhuyak Bay Section was opened in 2004 with a 50 ton GHJ. Following the herring allocation plan, this section was designated for purse seine gear in 2004. Purse seiners harvested 44 tons and commercial catch samples showed the predominant age classes were age-3 (57.7%), age-4 (22.7%), and age-5 herring (13.3%; Gretsch 2005b). A hydroacoustic survey after the fishery indicated up to 300 tons of herring were present in the Kizhuyak Bay Section. In 2005 the section was opened again to purse seine gear with a 50 ton GHJ and 44 tons were harvested (Table 3). No catch samples were obtained in 2005. A large school of forage fish overwintered in Kizhuyak Bay in December, 2005 and aerial surveys indicated that they were herring. The department research staff investigated by vessel survey in January 2006 but the fish observed in December were found to be capelin.

The Anton Larsen Bay (IM 20) and Sharatin Bay (IM 30) Sections were opened as a test fishery for gillnet gear in 2004. While the GHJ was 10 tons each, no gillnet permit holders fished either section. A hydroacoustic survey in early May 2004 found an estimated 200 tons of herring within the Anton Larsen Bay Section and 100 tons in the Sharatin Bay Section. The survey results indicate these sections have experienced an increase in herring biomass in the last two years, similar to the increase experienced in the adjacent Kizhuyak Bay Section. Neither of these sections were fished by gillnet gear in 2005; the Anton Larsen Bay Section had a 15 ton GHJ and the Sharatin Bay Section had a 10 ton GHJ.

Eastside District

Four bay complexes compose the Eastside District: Ugak Bay, Kiliuda Bay, East Sitkalidak Strait, and West Sitkalidak Strait. Sixteen sections have been established for the Eastside District and all but one, the Outer Sitkalidak Section (EA 40), have a history of herring sac roe harvests. Due to the reduced gillnet fleet and low herring prices, the smaller and more distant gillnet sections of this district have not been fished in recent years. Hydroacoustic surveys in this district are less frequent than other portions of the KMA.

Generally, the East and West Sitkalidak sections (EA 30 and EA 23) have the earliest spawning herring in the KMA, with initial spawns occurring in late March. In the mid 1990s the East and West Sitkalidak Sections were the major herring producers of the district, but stock abundance decreased in 1996 and 1997. Permit holders also had a difficult time finding marketable quality herring, as the stocks were generally mixed with ripe, green, and spawned out herring. The department reacted to the changes in the stocks by reducing the GHJs. From 1998 through 2003

the GHLS have been set low (30 to 50 tons per section) and the stocks have shown improvement; GHLS for both sections were increased in 2004 through 2005.

In 2004 the East Sitkalidak Strait Section was opened to gillnet gear with a 75 ton GHL; however, only 3.6 tons were harvested. From 2000 through 2003, this section was open to purse seine gear only and the GHL was caught annually. The poor gillnet harvest in 2004 was related to the low effort and doesn't reflect on the stock strength for this section. In 2005 East Sitkalidak Strait Section was designated for purse seine gear with a 100 ton GHL and 106.1 tons were harvested. The 2005 age compositions were 63.8% age-4 and 19.4% age-8 herring (Table 4). This section was closed by 1:25 p.m. on April 15. The fishery performance in 2005, age composition data, and spotter reports all indicate the stock status has improved from the lows experienced in 1998 through 2002.

The West Sitkalidak Section GHL was increased to 75 tons in 2004 and 125 tons in 2005. The section was open to purse seine gear in 2005 and 173.1 tons were harvested. Age composition from catch samples was 68.3% age -4 and 10.0 % age-8 herring (Table 4). Recruitment appears strong with age-3 herring representing 5.7% of the harvest. The fishery performance in 2005, age composition data, and spotter reports all indicate the stock status has improved from the lows experienced in 1997 through 2002.

The Barling Bay Section (EA 24), adjacent to the West Sitkalidak Section, has been the most consistent herring producer in the Eastside District. GHLS have ranged from 40 to 50 tons from 1996 through 2003. The purse seine GHL for this section was increased in 2004 and 2005 following the trend in increasing biomass. Commercial catch samples in 2004 were primarily composed of age-3 (80.1%), age-7 (4.7%), and age-11 (4.7%) herring (Gretsch 2005b). Commercial catch samples in 2005 had a strong showing of age-4 (64.2%) and age-8 (12.5%) herring. Recruitment did not appear to be strong with age-3 herring representing only 1.7% of the 2005 catch samples (Table 4).

The Three Saints Bay Section (EA 21), also adjacent to the West Sitkalidak Section, was designated as a gillnet section, but no permit holders have fished this section during the past five years. This section was designated exploratory in 2005 though no permit holders fished the section in 2005.

The Inner Kiliuda Bay (EA 44) and Outer Kiliuda Bay (EA 43) sections have been consistent and strong herring producers during the last 10 years. These two adjoining sections have been managed as one section during the last two seasons since the spawning stock is likely the same. In the Kiliuda Bay Sections in 2004, 258 tons were harvested (300 ton GHL). The 2004 GHL for these sections was the highest on record and was based on the high percentage (46.7%) of age-10 herring harvested during the 2003 fishery (Gretsch 2004b). Age composition of the 2004 commercial catch samples from the Kiliuda sections was predominantly age-3 (35.5%), age-11 (24.7%), age-10 (11.9%), and age-7 (9.9%) herring (Gretsch 2005b). Industry aerial surveys in 2003 through 2005 have reported the biomass in these two sections at approximately 3,000 to 4,000 tons. For the 2005 season the department assigned the Inner Kiliuda Bay Section to gillnet gears and the Outer Kiliuda Bay Section to purse seine gear (Table 3). This management action gave both gear types an opportunity to harvest herring from this strong stock. The Outer Kiliuda Bay Section had a GHL of 200 tons and 247 tons were harvested (Table 3). Commercial catch samples showed that age-4 (76.7%) was the strong age class followed by age-5 (9.0%; Table 4). The Inner Kiliuda Bay Section had a 75 tons GHL however gillnet permit holders caught only 14.7 tons. Age compositions from the commercial catch showed age-4 herring at 87.2% of the harvest, followed by age-5 at 10.6% (Table 5). Lack of fishing effort resulted in the low harvest for the Inner Kiliuda Bay Section.

The Shearwater Bay Section (EA 42), adjacent to the Outer Kiluida Bay Section, has also been a strong herring producer. However, in 2003 and 2004, fishing effort by gillnet gear was low and only 6.8 tons were harvested in 2003 (50 ton GHL) and 3.9 tons in 2004 (25 ton GHL). In 2005 the GHL was 30 tons and 37 tons were harvested. No catch samples were collected in 2004 and 2005. Samples from the gillnet catch in 2003 included age-10 (42.4%), age-3 (30.3%) and age-4 (15.1%) herring (Gretsch 2004b). Generally, age compositions from Shearwater Bay mirror those of the nearby Kiluida Bay Sections.

The Inner and Outer Ugak Bay sections (EA 51 and EA 50) also continued to be strong herring producers in 2005. The Inner Ugak Bay Section was designated for gillnet gear in 2000 through 2004. The Outer Ugak Bay Section has been designated for purse seine gear during the 2000 through 2004 seasons. A large harvest of 614 tons in the Outer Ugak Bay Section occurred in 2004. This large harvest prompted the department to switch gear areas for 2005, designating the Outer Ugak Bay Section for gillnet gear and the Inner Ugak Bay Section for purse seine gear. By switching areas it would give the Outer Ugak Bay Section a less intense fishery with gillnet gear. Although the 2004 harvest exceeded the 250 ton GHL, post fishery aerial surveys indicate at least 500 tons spawned in the section two days after the fishery occurred. Industry aerial surveys indicate that the combined herring biomass between the Inner and Outer Ugak Bay Sections totalled 3,000 to 4,000 tons.

The 2005 GHL for the Outer Ugak Bay Section was 100 tons; however, only 28 tons were harvested; a lack of effort was the main cause for the small harvest. For the Inner Ugak Bay Section the GHL was 150 tons and 167 tons were harvested. No roe recovery problems were encountered with the seine harvest and the age compositions were 35.5% age-12, 23.2% age-4, 9.6% age-11, 9.6% age-5 and 9.2% age-3 (Table 4). During the 2000 through 2004 seasons in the Inner Ugak Bay Section, the gillnet permit holders had roe quality problems (high male sex ratios). With high male abundance it is difficult to obtain a marketable roe percentage. Catch samples in 2004 consisted primarily of age-11 herring (52.7%), of which 62% were males. Other age classes showed even sex ratios and the only other dominant age class was age-10 herring at 30.9%. Herring frequently move between the Inner and Outer Ugak Bay Sections, spawning occurs within each section, but size-at-age and recruitment events tend to indicate these herring are likely the same stock.

No new information is available for the Pasagshak Bay Section (EA 52), a gillnet section adjacent to the Outer Ugak Bay Section. No one fished this section in 2004, nor has there been a harvest during the past five years, and the department closed this section for the 2005 season. The Tanginak Anchorage Section (EA 31) was closed from 1998 through 2003. This section was opened in 2004 as a test fishery for gillnet gear. However no gillnet permit holders fished the section in 2004, and no new information was obtained. In 2005 the section was designated exploratory though no harvest occurred.

Alitak District

The Alitak District comprises 10 sections and all but the Outer Alitak Section (AL 10) are known to have stocks of herring (Figure 4). Large stocks of herring were once found in Olga, Deadman, and Sulua Bays and commercial harvests ranged from 500 to 900 tons annually for 1991 through 1994 (Gretsch et al. 1992, 1993, 1994, 1995). From 1991 through 1993, the Upper Olga Bay stock was the first large stock of the district that experienced declines in abundance. The department reacted by reducing the GHL, but by 1995 the catch had dropped to zero. By 1995 the Inner and Outer Deadman Bay Sections were also experiencing declining fishery performance and, similarly, the GHLs were reduced in 1996 and 1997. In 1997 the last large herring stock of the district, in Sulua Bay, also appeared to be declining based aerial and hydroacoustic surveys. In 1998, seven sections

of the Alitak District were closed to fishing. The department has since relied on aerial surveys to assess changes in stock status. Three sections were opened in 2004 (two are seine areas) to act as test fisheries.

In 2002 industry spotter pilot reports indicated a major increase in herring abundance in the Alitak District (Gretsch 2003b). Stocks in the Inner Deadman Bay (AL 21), Outer Deadman Bay (AL 22), Inner Alitak Bay (AL 20), Portage Bay (AL 31), and Upper Olga Bay (AL 50) sections had improved. In 2003 and 2004 similar spotter pilot reports indicated continued improvements in the Alitak District. However, the Sulua Bay Section stock status still remains poor, with no herring observed. In 2003 and in 2004, the Inner and Outer Deadman Bay sections were opened to gillnet gear as a test fishery, with a 20 ton GHJ in 2004. The Upper Olga Bay Section was also open to gillnet gear in 2003 and 2004, with a 10 ton GHJ. No gillnet permit holders have fished this district during the last two years. In 2004 season, the department opened the Inner Alitak and Portage Bay Sections to purse seine gear, with a combined GHJ of 75 tons and 51.5 tons were harvested (Gretsch 2005b). No catch samples were taken; however, permit holders suggest that recruitment was strong as there were large numbers of age-3 herring present in their harvest. Industry spotter pilots reported continued improvement in the volume and distribution of herring within Alitak and Deadman Bays. The remaining sections open to seine gear were not fished in 2004.

In 2005 based on the improved stock status of herring in the Alitak District, the department put more effort into monitoring the fishery and assessing the herring biomass. This included hydroacoustic surveys before and during the fishery, aerial surveys during and after the fishery, plus stationing a field crew and vessel in the district. Like the Eastside District, age-4 herring were the dominant age class found in the Alitak District. For the Inner Deadman Section a 75 ton GHJ was established for purse seine gear and 103 tons were harvested (Table 3). Age classes from the harvest included age-4 (77.2%) and age-3 (14.7%) fish (Table 4). An aerial survey in early June estimated that 800 to 1000 tons of herring are present in the Inner Deadman Section and this was the largest amount of herring observed during any survey in 2005. The Outer Deadman Bay Section was also open to purse seine gear as 82 tons (75 ton GHJ) were harvested. Age classes from this harvest included age-4 (78.9%) and age-3 (8.1%; Table 4). Aerial surveys in early May and early June result in estimates of 500 to 700 tons for this section. For the Portage Bay and Inner Alitak Sections the department has combined these two sections and managed them as one since 2003. For the 2005 fishery a 75 ton GHJ was established and 98 tons were harvested (Table 3). Aerial and hydroacoustic surveys could only locate 200 to 300 tons near Akhiok Reef though an aerial survey in early June located an additional 200 to 300 tons on the eastern shore (Portage Bay) of Alitak Bay. In the Sulua Bay Section no herring were found while gillnet vessels were in the district in early May. There was a 60 ton GHJ and no herring were harvested (Table 3). An early June aerial survey found 350 to 400 tons in this section. The Moser and Olga Bays were also surveyed and the Lower Olga/Moser Bay Section 300 to 400 tons were observed in early May along Dog Salmon Flats and the eastern shore of the section. This section was closed to commercial fishing in 2005. The North Olga Bay Section was also surveyed and the early May aerial surveys found 200 to 300 tons along the shoreline from Akalura to Stockholm Point. This section was open to commercial fishing as an exploratory unit and 35.7 tons were harvested by purse seine. Age compositions from the harvest were 82.8 % age-4, 9.0% age-5, and 4.0 % age-3 (Table 4). The Upper Olga Bay Section was surveyed in early May, hydroacoustic surveys found the most herring with scattered schools seen from Stockholm Point to Upper Station, and some small schools east of Stormy Point. The combined observed biomass totaled approximately 300 tons. This section was also open to commercial fishing as an exploratory section, purse seiners caught herring in this section; however,

the roe ripeness was not of marketable quality and herring caught were released. Based on the survey results herring were observed moving within the three sections of Olga and Upper Moser Bays.

Mainland Districts

There are three Mainland Districts, comprising 12 sections. These districts experience more extreme weather than other districts in the KMA. Conditions frequently consist of high winds, low ceilings, and limited visibility, greatly reducing the effectiveness of spotter pilots. The severity of the weather in the spring likely reduces the productivity of these herring stocks, compared to the more protected waters of Kodiak and Afognak Islands. The last commercial herring harvest from the Mainland Districts occurred in 1997. The department increased fishing opportunities in 2004 by opening seven sections as exploratory. No one fished the Mainland Districts in 2004 and there is no new information concerning herring stocks in the Mainland Districts.

Sturgeon/Halibut District

The Sturgeon/Halibut District is located on the southwest side of Kodiak Island, and has no management sections. This district consists mostly of offshore areas that are not known to have, or are not likely to have a spawning stock of herring; no GHL has been established. Herring are found in this district during the summer months.

HERRING FOOD AND BAIT FISHERY

HISTORICAL PERSPECTIVE

The earliest recorded commercial herring food and bait harvest in the KMA occurred in 1912 (Table 8). In the early 1920s, the fishery expanded and large herring were sought for food products, such as salted and pickled herring, which were in high demand after World War I. By the late 1920s the demand for herring food products had declined and the fishery switched to reduction products, such as fishmeal and oil. During the peak years of the reduction fishery (1934 to 1950) harvests vastly surpassed recent food and bait herring harvests (Figure 10). During the reduction fishery the major harvest areas were located in eastern Shelikof Strait and adjacent bays and straits along the west side of Kodiak and Afognak Islands. Quotas and harvest weights were measured by barrels (250 lbs. of herring equaled one barrel) until 1956 when the unit of measure was changed to short tons. Large (approximately 70 foot) "sardine seiner" type vessels were used in conjunction with holding pounds to supply herring to five major reduction plants (Manthey et. al. 1978). In addition, small seine and gillnet operators participated in a portion of the food fishery and delivered to floating and shorebased salting and pickling operations.

From the early 1960s to 1973 there were no harvest quotas or closed seasons. From 1974 through 1980 an open fishing season was established between July 1 and February 28. In 1979 and 1980, GHLS for the food and bait season were established at 12,600 tons. The season opening date for the fishery changed from July 1 to August 15 for the years 1981 through 1984. As a result of the rapidly developing sac roe fishery, the GHL for the food and bait season was reduced to 1,000 tons in 1981 and remained at that level through 1987. In 1985 the season opening date was moved to August 1. Regulatory GHLS for the herring food and bait fishery were replaced with a regulatory harvest strategy in 1988 that established variable GHLS based on herring stock status. The season opening date was moved to October 1 in 1999 to allow department staff additional time to prepare the Kamishak herring forecast and manage the fishery in the fall. In 2005 the season opening date

switched to September 1 to allow for more market opportunities for the herring as bait in the Bering Sea king crab fishery. The herring food and bait season closing date has remained February 28.

Fishing periods through 1996 were unrestricted, 24 hours per day, seven days per week. In 1997 fishing periods were reduced to 12 hours (8:00 a.m. to 8:00 p.m.), seven days per week. The restriction of fishing period length was intended to slow harvest rates in order to ensure that GHFs were not greatly exceeded.

Gear used in this fishery includes trawl, seine, and gillnet. Gear was first restricted for the 1986 season when seine gear was limited to 100 fathoms in length and 1,025 meshes in depth and gillnet gear was limited to 150 fathoms in length with no depth restrictions. For the 1993 season purse seine specifications were increased to 150 fathoms in length and 1,625 meshes in depth. These changes made seine gear more competitive with trawlers; seine fishermen harvested an average of only 2% of the food and bait harvest from 1987 to 1992 compared to 54% of the total harvest from 1993 to 1998. There are no restrictions on trawl gear, which is fished mid-water with no bottom contact. All three gear types fished the same areas and were subject to the same fishing periods.

In 2001 this fishery was designated as a limited entry fishery by the Commercial Fisheries Entry Commission (CFEC) and a points system was developed to evaluate past fishery participation and determine who would receive a limited entry permit. In 2002 CFEC issued limited entry permits that included five purse seine/gillnet permits and four trawl permits.

MANAGEMENT PLAN HISTORY

During the fall and winter months of the early 1980s, major concentrations of herring were observed in eastern Shelikof Strait and adjacent bays along the west side of the Kodiak Archipelago. The biomass exceeded that of known KMA spawning stocks. Herring food and bait fishermen targeted these herring, but the origin of the stock was questioned. In 1986 a stock identification study, based on scale pattern analysis, was conducted on herring harvested from a large biomass located in the northeastern part of the Shelikof Strait (Johnson et. al. 1988). The study concluded that at least 80% of the Shelikof herring catch sampled were Kamishak Bay stocks, which spawn within the Lower Cook Inlet (LCI) Management Area.

In 1988 the BOF allocated not more than two percent of the previous season's total available Kamishak Bay spawning herring biomass for harvest during the Kodiak herring food and bait fishery. For local Kodiak spawning stocks, which were exploited during the sac roe fishery, the food and bait GHF was to be determined based on 10% of the harvest that occurred in the previous KMA herring sac roe season.

Problems subsequently developed after implementation of this management plan because it was difficult to assign harvest from the intermixed stocks to either Kodiak or Kamishak if the stocks from both areas had similar age compositions. This plan was in effect through the 1992/93 season.

In the fall of 1992 the BOF approved the Kamishak Bay District Herring Management Plan (5 AAC 27.465), which outlines criteria for the management of the Kamishak Bay herring sac roe and the Shelikof Strait herring food and bait fisheries (ADF&G 2005-2006). This plan defines allocations to each fishery based on biomass estimates.

In 1993 the BOF placed into regulation a harvest strategy defining the criteria for managing the Kodiak herring food and bait fishery (5 AAC 27.535(a-d)). This strategy combines the Kamishak stock GHF with the Kodiak stock GHF for food and bait districts (West Afognak District), (Uganik

District), and the (Uyak District; Figure 4). This portion of the KMA food and bait fishery is referred to as the Shelikof Strait food and bait herring fishery. The Kamishak allocation to the Shelikof Strait food and bait herring fishery ranges from 1% to 2% of the Kamishak spawning biomass. When the combined GHL is achieved the Shelikof Strait food and bait (West Afognak, Uganik, and Uyak) are closed collectively. This harvest strategy alleviates the problem of identifying the spawning stock of a harvest in areas where intermixing may occur. The plan also closes the Kamishak Bay sac roe fishery and the Shelikof Strait food and bait fishery north of the latitude of Miners Point (Uganik Bay) when the Kamishak spawning biomass falls below 8,000 tons (the minimum Kamishak spawning biomass threshold; ADF&G 1993).

In 1999 the BOF made additional changes to the KMA herring food and bait fishery. The season opening date was changed to October 1 so department staff in the LCI management area would have additional time to complete the Kamishak herring forecast and determine the resulting allocation for the Shelikof Strait food and bait fishery. Prior years' fisheries generally occurred based on preliminary Kamishak forecasts, and actual harvests were often either lower or higher than the final Kamishak allocation, which was sometimes completed weeks after the fishery occurred. The harvest strategy was also changed so that GHLs for KMA stocks were based upon 10% of the GHLs established for the preceding KMA sac roe fishery by section. The previous regulation based the food and bait GHL upon 10% of the actual KMA sac roe harvest by section. In cases where an excessive harvest occurred during the sac roe fishery, the related food and bait GHL would also be high. Lastly, changes to the plan clarified and put into regulation the previous practice of limiting a district harvest to no more than the sum of the individual section GHLs it contains. These changes promoted a more conservative approach to managing this fishery.

In November 2001 the BOF adopted changes to the Kamishak Bay District Herring Management Plan based on the results of a threshold analysis performed by LCI department staff. The analysis concluded that the minimum spawning biomass threshold should be 6,000 tons (5 AAC 27.465.(e)(3)), 2,000 tons less than the previous minimum spawning biomass threshold (8,000 tons). Other changes to the plan included a reduction in the maximum exploitation rate for Kamishak herring, which in turn lowered the allowable exploitation rate of the Shelikof Strait fishery from 2% to 1.5% of the Kamishak spawning biomass. Last, a portion of the plan, which required adjustment of Shelikof Strait young age class harvests to reflect the estimated weight of an equal amount of older age class herring, was eliminated.

KAMISHAK FISHERY CLOSURE

The biomass forecast for Kamishak Bay herring for the 2006 season was estimated at approximately 2,650 tons, well below the minimum spawning biomass of 6,000 tons that must be met before commercial fisheries may occur. (Hammarstrom 2005). Additionally, stock assessment surveys determined that approximately 58% of the population consisted of younger age class fish. The Kamishak Bay District Herring Management Plan states that commercial harvests must target older, repeat spawners in order to protect recruit-class herring. This was the eighth consecutive year that the Kamishak Bay District fishery has been closed and the population has sharply declined during the last six years (Otis and Cope 2004). Due to the low stock status, the Kamishak Bay sac roe fishery closed for the 2006 season and the Shelikof Strait food and bait fishery north of the latitude of Miner's Point closed for the 2005/2006 season.

FOOD AND BAIT COMBINE FISHERIES 2001 TO 2005

The KMA herring food and bait fishery was closed for the 1999 and 2000 seasons because of low potential GHLS and the department's concern for manageability of a competitive fishery on a highly aggregated stock. In 2001 the Commercial Fisheries Entry Commission (CFEC) designated the KMA herring food and bait fishery a limited entry fishery and issued 13 interim use permits to those fishermen who made landings between 1994 and 1998 (Gretsch 2003b). However, because of the relatively small GHLS available (60 tons in the Uganik District and 47 tons in the Eastside District) the department again did not allow an open competitive fishery to occur even though the fishery was restricted to the 13 interim permit holders. As an alternative, the interim permit holders formed a combine and the department and CFEC agreed to allow a combine fishery to occur. The 13 interim permit holders determined which vessel would conduct the harvest, all marketing aspects, and all costs associated with harvesting and tendering the herring. The 2001 combined fishery resulted in a harvest of 63 tons of food and bait herring from the Uganik District (Village Islands) and 52 tons from the Eastside District (Ugak Bay).

In July 2002, the CFEC made a final determination on limited entry permits. Nine permanent limited entry permits were issued, five were purse seine/gillnet permits and four were trawl permits. The Kamishak Bay District fishery was closed for 2003 due to below threshold stock abundance, so only a portion of the Uganik District (south of Miners Point; 72 ton GHL) and the Eastside District (62 ton GHL) could be opened to food and bait herring fishing (Gretsch 2003b). The department again had harvest concerns and the nine permit holders agreed to conduct a combine fishery, as in 2001. The department and combine agreed to a single catcher vessel on the grounds and a department observer was present onboard the fishing vessel during the fishery. The 2002/2003 KMA herring food and bait combine fishery resulted in a 74 ton harvest from the Uganik District, and a 61 ton harvest from the Eastside District.

Combine fisheries have been conducted under similar conditions for the 2003, 2004, and 2005 seasons. Different purse seine permit holders have participated in the harvesting of the herring for a larger portion of the proceeds, while the trawl permit holders and those purse seine permit holders who are not harvesting receive a check for a lesser portion of the total combine proceeds. Generally one tender has also been used and two purse seine permit holders have worked together on one purse seine vessel to catch the herring. Fishing efforts have targeted the two larger GHL areas including the Uganik and Eastside Districts while the two smaller GHL areas the Alitak and Uyak Districts have remained unfished. The trawl permit holders have not participated in the harvesting for the combine fishery. The combine fishery on some years has gone smoothly and other years disagreements have occurred when the harvesting permit holders failed to catch the herring or failed to meet market deadlines.

For the 2005/2006 season the permit holders again requested a combine fishery though there was some discussion of having a competitive fishery. The biggest obstacle to a competitive fishery is how to decide an equitable fishing period for the two gear types. The department agreed with the permit holders request and that portion of the Uganik District south of Miners Point, was opened at noon September 28 with one purse seiner and one tender on the grounds. Three EO's were issued for this fishery. Approximately 67 tons were harvested on October 3 of the 156 ton GHL (Gretsch 2005c). The 67 tons harvested provided the bulk of the herring bait needed for the Bering Sea red king crab fleet ported in Kodiak. On December 12 a second trip was made to the Uganik District; however, the purse seiner was unable to catch any herring in four days. A second purse seine vessel went back out to the Uganik District on December 20 and caught 95

tons on December 21. The department issued an EO closing the Uganik District effective at 10:00 a.m. December 22 and the total harvest was 167.8 tons. The harvest from the second delivery was used primarily for the Kodiak Tanner crab fishery that was scheduled to open January 15, 2006. There were no further requests from the permit holders to open any of the other districts, although one processor said he would have liked to have purchased more herring. There was approximately 146 tons available for harvest in three other districts that were not opened for the 2005/2006 season.

CATCH SAMPLING

A total of 174 herring were collected for AWL analysis from first fishing period in the Uganik District by purse seine gear. Age compositions from the sample were 0.5% age-1, 10.9% age-2, 34.4% age-3, 20.1% age-4, 16.0% age-5, 9.1% age-6, 6.3% age-7, and 2.3% age-8+.

HERRING SUBSISTENCE FISHERY

FISHERY CHARACTERISTICS

Prior to 1999, the herring subsistence fishery was referred to as a Personal Use/Subsistence Fishery and had occurred for at least twenty years. The majority of the harvest occurred near the Port of Kodiak in Womens Bay and was caught by gillnets. The herring were used primarily for bait in commercial longline and pot fisheries. Also, prior to 1999 this fishery was only regulated during the herring sac roe season, from April 15 to June 30, under the conditions of the subsistence permit issued in Kodiak. Gear was limited to a 25 fathom gillnet but there was no harvest limit. The remainder of the year there were no permit requirements, gear restrictions, or harvest limits.

In 1999 more restrictive regulations were approved by the BOF. These regulations allowed for a harvest of up to 500 pounds of herring with no permit requirements, except during the sac roe fishing season (April 15 to June 30; Gretsche 2001.) A subsistence permit was required for those individuals that wished to fish during the sac roe season or fishers intending to harvest more than 500 pounds of herring annually. The maximum annual harvest was limited to 2,000 pounds per permit. In recent years most of the herring caught for subsistence were used for bait (in sport or commercial fisheries), food, or fertilizer.

In 2000 herring subsistence harvests escalated due to bait needs created with the reopening of the commercial tanner crab fishery in the KMA. The department was concerned about the increased herring subsistence harvest and the appropriateness of taking subsistence herring for use as bait in a commercial fishery. The department submitted proposals for regulation changes to the BOF in 2001, and the BOF changed regulations to allow for both types of historic harvests. The new subsistence regulation allows for the harvest of up to a total of 500 pounds of herring annually and requires that fishermen obtain a permit prior to fishing (5 AAC 01.530. (d)). Herring were included on the existing KMA salmon and crab subsistence permit. Also in 2000 a new regulation (5 AAC 27.545) allows for the harvest of up to 500 pounds of herring by commercial permit holders to be used as bait in commercial fisheries.

2005 SEASON SUMMARY

Through November 22, 2006 approximately 85% of the KMA subsistence permits were returned to the department as required for reporting purposes with subsistence harvest information from 2005. Subsistence herring harvests for 2005 totaled 5,335 pounds (Table 9). A total of 37 KMA subsistence permits were returned with herring harvest data, with most of the harvest coming from

the Eastside District. No commercial permit holders harvested herring to be used as bait in commercial fisheries during 2005.

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TABLES AND FIGURES

Table 1.-Historical harvest data for the commercial herring sac roe and food and bait fisheries and percent of the total annual herring harvest that occurs by fishery, Kodiak Management Area, 1964 to 2005.

Year	Sac Roe Harvest (Tons) ^a	Food/Bait Harvest (Tons) ^a	Total Herring Harvest (Tons) ^a	Sac Roe Fishery Percent of Total Harvest (%)	Food/Bait Fishery Percent of Total Harvest (%)
1964	568	310	878	65%	35%
1965	657	35	692	95%	5%
1966	2,769	198	2,967	93%	7%
1967	1,662	300	1,962	85%	15%
1968	2,001	15	2,016	99%	1%
1969	1,130	11	1,141	99%	1%
1970	342	8	350	98%	2%
1971	284	44	328	87%	13%
1972	215	50	265	81%	19%
1973	831	178	1,009	82%	18%
1974	868	40	908	96%	4%
1975	8	5	13	62%	38%
1976	5	0	5	100%	0%
1977	338	0	338	100%	0%
1978	904	399	1,303	69%	31%
1979	1,735	125	1,860	93%	7%
1980	2,383	381	2,764	86%	14%
1981	2,065	18	2,083	99%	1%
1982	1,771	326	2,097	84%	16%
1983	2,318	33	2,351	99%	1%
1984	2,163	123	2,286	95%	5%
1985	1,968	102	2,070	95%	5%
1986	1,558	213	1,771	88%	12%
1987	2,146	217	2,363	91%	9%
1988	2,171	340	2,511	86%	14%
1989	2,249	345	2,594	87%	13%
1990	2,347	313	2,660	88%	12%
1991	2,432	215	2,647	92%	8%
1992	4,283	312	4,595	93%	7%
1993	4,929	837	5,766	85%	15%
1994	5,893	677	6,570	90%	10%
1995	4,604	507	5,111	90%	10%
1996	3,386	651	4,037	84%	16%
1997	3,235	756	3,991	81%	19%
1998	2,057	151	2,208	93%	7%
1999	1,651	0	1,651	100%	0%
2000	1,370	0	1,370	100%	0%
2001	1,694	115	1,809	94%	6%
2002	1,677	135	1,812	93%	7%
2003	1,992	199	2,191	91%	9%
2004	3,167	190	3,357	94%	6%
2005	3,463	168	3,631	95%	5%
Average					
1964 to 2005	1,983	215	2,198	90%	10%
10 Year					
1996 to 2005	2,369	237	2,606	91%	9%
5 Year					
2001 to 2005	2,399	138	2,472	97%	6%

^a Short tons; 1 short ton = 2000 lbs.

Table 2.-Herring sac roe fishery summary of season length, guideline harvest level (GHL), harvest data by gear type, percentage of harvest by gear type, number of landings, and estimated exvessel earnings, Kodiak Management Area, 1979-2005.

Year	Season Length (Days)	GHL (Tons)	Total Harvest (Tons)	Harvest		Percent Harvest		Number of		Units of Gear		Average Catch		Estimated Average		Price per Ton ^b (\$)	Estimated Exvessel Total Value ^b (\$)
				by Gear Type		by Gear Type		Landings by Gear		Fished ^a		by Gear		Earnings ^b			
				Seine (Tons)	Gillnet (Tons)	Seine	Gillnet	Seine	Gillnet	Seine	Gillnet	Seine (Tons)	Gillnet (Tons)	Seine (\$)	Gillnet (\$)		
1979	36	2,400	1,735	1,457	278	84%	16%	-	-	57	125	26	2	\$38,342	\$3,336	\$1,500	\$2,602,500
1980	35	2,400	2,383	2,009	374	84%	16%	-	-	92	109	22	3	\$15,068	\$2,368	\$690	\$1,644,270
1981	48	2,400	2,065	1,596	469	77%	23%	207	406	79	114	20	4	\$14,647	\$2,983	\$725	\$1,497,125
1982	59	2,400	1,771	1,447	324	82%	18%	138	191	45	67	32	5	\$17,686	\$2,660	\$550	\$974,050
1983	51	2,400	2,319	1,797	522	77%	23%	164	284	41	64	44	8	\$35,063	\$6,525	\$800	\$1,855,200
1984	54	2,400	2,163	1,691	472	78%	22%	138	212	39	69	43	7	\$34,687	\$5,472	\$800	\$1,730,400
1985	59	2,000	1,968	1,244	724	63%	37%	118	348	34	81	37	9	\$32,929	\$8,044	\$900	\$1,771,200
1986	61	1,690	1,558	1,110	448	71%	29%	132	385	31	71	36	6	\$34,016	\$5,994	\$950	\$1,480,100
1987	61	1,640	2,146	1,591	554	74%	26%	122	411	29	62	55	9	\$54,862	\$8,935	\$1,000	\$2,146,000
1988	59	2,065	2,171	1,304	867	60%	40%	169	555	33	76	40	11	\$51,370	\$14,830	\$1,300	\$2,822,300
1989	76	2,415	2,249	1,513	736	67%	33%	171	627	37	83	41	9	\$34,758	\$7,537	\$850	\$1,911,650
1990	75	2,375	2,347	1,644	703	70%	30%	156	544	27	63	61	11	\$51,756	\$9,485	\$850	\$1,994,950
1991	83	2,510	2,432	1,697	735	70%	30%	169	587	32	64	53	11	\$45,077	\$9,762	\$850	\$2,067,200
1992	77	2,720	4,283	3,260	1,023	76%	24%	185	706	40	74	82	14	\$40,750	\$6,912	\$500	\$2,141,500
1993	77	3,525	4,929	4,203	726	85%	15%	237	294	41	86	103	8	\$56,382	\$4,643	\$550	\$2,710,950
1994	71	4,550	5,893	4,976	917	84%	16%	285	485	66	57	75	16	\$60,315	\$12,870	\$800	\$4,714,400
1995	73	4,480	4,604	3,837	768	83%	17%	280	642	73	71	53	11	\$66,858	\$13,759	\$1,272	\$5,856,288
1996	69	4,180	3,386	2,322	1,064	69%	31%	202	890	57	74	41	14	\$81,474	\$28,757	\$2,000	\$6,772,000
1997	49	3,435	3,235	2,629	606	81%	19%	183	418	64	59	41	10	\$20,539	\$5,136	\$500	\$1,617,500
1998	50	2,030	2,057	1,954	103	95%	5%	110	26	35	7	56	15	\$27,914	\$7,357	\$500	\$1,028,500
1999	38	1,495	1,651	1,589	62	96%	4%	94	16	31	5	51	12	\$33,984	\$8,221	\$663	\$1,094,613
2000 ^c	37	1,735	1,370	1,290	80	94%	6%	57	23	31	10	42	8	\$29,129	\$5,600	\$700	\$959,000
2001	47	1,540	1,694	1,412	282	83%	17%	67	37	33	9	43	31	\$21,394	\$15,667	\$500	\$847,000
2002	46	1,860	1,677	1,274	403	76%	24%	37	50	30	14	42	29	\$21,233	\$14,393	\$500	\$838,500
2003	42	2,600	1,992	1,738	254	87%	13%	59	45	31	11	56	23	\$28,032	\$11,545	\$500	\$996,000
2004	42	2,850	3,167	2,894	273	91%	9%	95	36	27	11	107	25	\$53,593	\$12,409	\$500	\$1,583,500
2005	31	3,475	3,463	2,932	531	85%	15%	134	61	32	12	92	44	\$45,813	\$22,125	\$500	\$1,731,500
Average																	
1979 to 2005	56	2,577	2,619	2,089	530	79%	21%	148	331	43	57	50	13	\$38,803	\$9,531	\$806	\$2,125,489
10 Year																	
1996 to 2005	45	2,520	2,369	2,003	366	86%	14%	104	160	37	21	57	21	\$36,310	\$13,121	\$686	\$1,746,811
5 Year																	
2001 to 2005	42	2,465	2,399	2,050	349	85%	15%	78	46	31	11	68	30	\$34,013	\$15,228	\$500	\$1,199,300

^a From 1979 to 1998 fishery participation was based on vessels making landings; 1999 to 2005 data are based on actual fishery participation.

^b Exvessel values are based on dock delivered herring and inseason data.

^c Beginning in 2000, an allocative harvest strategy was in effect.

Table 3.-Herring sac roe fishery guideline harvest level (GHL) by section and gear type, harvest by section, and date sections were closed, Kodiak Management Area, 2005.

Statistical Area	Management Section	Date Closed ^a	Purse Seine		Gillnet	
			GHL	Harvest	GHL	Harvest
NORTH AFOGNAK DISTRICT						
NA10	Shuyak Island	CLOSED	-	-	-	-
NA20	Delphin Bay	CLOSED	-	-	-	-
NA30	Perenos Bay	6/30/2005	EXPLORATORY	7	EXPLORATORY	0
NA40	Seal Bay	CLOSED	-	-	-	-
NA50	Tonki Bay	6/30/2005	EXPLORATORY	16	EXPLORATORY	0
WEST AFOGNAK DISTRICT						
WA10	Raspberry Strait	CLOSED	-	-	-	-
WA20	Malina Bay	6/30/2005	CLOSED	-	10	0
WA31	Paramanof Bay	Did not open, low	250	0	CLOSED	-
WA32	Foul Bay	stock abundance.	Note: Sections WA31 and WA32 managed as one.			
WA40	Blue Fox/Devil's Inlet	6/30/2005	EXPLORATORY	0	EXPLORATORY	0
WA50	Offshore W. Afognak	CLOSED	-	-	-	-
SOUTH AFOGNAK DISTRICT						
SA10	Izhut Bay	4/27/2005	Note: Sections SA10, SA20, and SA30 managed as one section, 15 ton GHL.			
SA20	Kitoi Bay	4/27/2005				
SA30	MacDonalds Lagoon	4/27/2005	CLOSED	-	15	36
SA40	Danger Bay	6/30/2005	CLOSED	-	70	47
SA50	Litnik	CLOSED	-	-	-	-
SA60	Duck Bay	CLOSED	-	-	-	-
AFOGNAK DISTRICTS TOTAL			250	23	95	82
UGANIK DISTRICT						
UG10	Kupreanof	CLOSED	-	-	-	-
UG20	Viekoda Bay	6/30/2005	CLOSED	-	25	3
UG21	Terror Bay	6/30/2005	CLOSED	-	30	29
UG31	West Uganik Passage	6/30/2005	CLOSED	-	60	18
UG30	Village Island	Purse Seine 4/25/2005	1200	1311	250	253
UG32	NE Arm Uganik	Gillnet 4/27/2005	Note: Sections UG30, UG32, UG33, and UG 34 were managed as one section and with an allocation by gear type.			
UG33	E. Arm Uganik	-				
UG34	S. Arm Uganik	-				
UG40	Offshore Uganik	CLOSED	-	-	-	-
UGANIK DISTRICT TOTAL			1200	1311	365	303
UYAK DISTRICT						
UY10	Offshore Uyak	CLOSED	-	-	-	-
UY20	Harvester Island	CLOSED	-	-	-	-
UY30	Inner Uyak	Purse Seine 4/17/2005 Gillnet 6/30/2005	250	406	50	0
UY32	Browns Lagoon	CLOSED	-	-	10	8
UY31	Larsen Bay	CLOSED	-	-	-	-
UY40	Zachar Bay	5/12/2005	CLOSED	-	20	25
UY50	Spiridon Bay	CLOSED	-	-	-	-
UYAK DISTRICT TOTAL			250	406	80	33

-continued-

Table 3.-page 2 of 3

Statistical Area	Management Section	Date Closed ^a	Purse Seine		Gillnet	
			GHL	Harvest	GHL	Harvest
ALITAK DISTRICT						
AL10	Outer Alitak	CLOSED	-	-	-	-
AL20	Inner Alitak	5/7/2005	75	98	CLOSED	-
AL21	Inner Deadman Bay	5/2/2005	75	104	CLOSED	-
AL22	Outer Deadman Bay	5/3/2005	75	82	CLOSED	-
AL30	Sulua Bay	6/30/2005	CLOSED	-	60	0
AL31	Portage Bay	Note: Sections AL20, AL31, and part of AL40 managed as one section, 75 t.GHL.				
AL40	Lower Olga/Moser	CLOSED	-	-	-	-
AL41	No. Upper Olga Bay	5/4/2005	EXPLORATORY	36	EXPLORATORY	0
AL50	Upper Olga Bay	6/30/2005	EXPLORATORY	0	EXPLORATORY	0
AL60	Geese/Twoheaded	6/30/2005	EXPLORATORY	0	EXPLORATORY	0
ALITAK DISTRICT TOTAL			225	319	60	0
STURGEON/HALIBUT DISTRICT						
SH10	Sturgeon/Halibut	CLOSED	CLOSED	-	CLOSED	-
EASTSIDE DISTRICT						
EA10	Kaiugnak	6/30/2005	EXPLORATORY	0	EXPLORATORY	0
EA20	SW. Sitkalidak	6/30/2005	EXPLORATORY	0	EXPLORATORY	8
EA21	Three Saints Bay	6/30/2005	EXPLORATORY	0	EXPLORATORY	0
EA22	Newman Bay	6/30/2005	EXPLORATORY	0	EXPLORATORY	0
EA23	W. Sitkalidak Strait	4/15/2005	125	173	CLOSED	-
EA24	Barling Bay	4/15/2005	75	136	CLOSED	-
EA30	E. Sitkalidak St.	4/15/2005	100	106	CLOSED	-
EA31	Tanginak Anchorage	6/30/2005	EXPLORATORY	0	EXPLORATORY	0
EA40	Outer Sitkalidak	CLOSED	CLOSED	-	CLOSED	-
EA41	Boulder Bay	CLOSED	CLOSED	-	CLOSED	-
EA42	Shearwater Bay	5/11/2005	CLOSED	-	30	37
EA43	Outer Kiliuda Bay	5/7/2005	200	247	CLOSED	-
EA44	Inner Kiluida Bay	6/30/2005	CLOSED	-	75	15
EA50	Outer Ugak Bay	6/30/2005	CLOSED	-	100	28
EA51	Inner Ugak Bay	4/25/2005	150	167	CLOSED	-
EA52	Pasagshak	CLOSED	CLOSED	-	CLOSED	-
EASTSIDE DISTRICT TOTAL			650.0	830	205	88
NORTHEAST DISTRICT						
NE10	Womens Bay	5/2/2005	CLOSED	-	20	25
NE20	Kalsin Bay	CLOSED	-	-	-	-
NE30	Middle Bay	CLOSED	-	-	-	-
NE40	Inshore Chiniak	CLOSED	-	-	-	-
NE50	Offshore Chiniak	CLOSED	-	-	-	-
NORTHEAST DISTRICT TOTAL			-	-	20	25
INNER MARMOT DISTRICT						
IM10	Monashka Bay	CLOSED	CLOSED	-	CLOSED	-
IM20	Anton Larsen Bay	6/30/2005	CLOSED	-	15	0
IM30	Sharatin Bay	6/30/2005	CLOSED	-	10	0
IM40	Kizhuyak Bay	4/19/2005	50	44	CLOSED	-
IM50	Spruce Island	CLOSED	-	-	-	-
INNER MARMOT DISTRICT TOTAL			50	44	25	0

-continued-

Table 3.-page 3 of 3

Statistical Area	Management Section	Date Closed ^a	Purse Seine		Gillnet	
			GHL	Harvest	GHL	Harvest
NORTH MAINLAND DISTRICT						
NM10	Hallo Bay	CLOSED	-	-	-	-
NM20	Inner Kukak	6/30/2005	EXPLORATORY	0	EXPLORATORY	0
NM30	Outer Kukak	CLOSED	-	-	-	-
NM40	Missak Bay	CLOSED	-	-	-	-
NORTH MAINLAND DISTRICT TOTAL				0		0
MID MAINLAND DISTRICT						
MM10	Inner Katmai	6/30/2005	EXPLORATORY	0	EXPLORATORY	0
MM20	Outer Katmai	CLOSED	-	-	-	-
MM30	Alinchak	6/30/2005	EXPLORATORY	0	EXPLORATORY	0
MM40	Puale Bay	6/30/2005	EXPLORATORY	0	EXPLORATORY	0
MM50	Portage Bay	6/30/2005	EXPLORATORY	0	EXPLORATORY	0
MM60	Outer Portage	6/30/2005	EXPLORATORY	0	EXPLORATORY	0
MID MAINLAND DISTRICT TOTAL				0		0
SOUTH MAINLAND DISTRICT						
SM10	Wide Bay	6/30/2005	EXPLORATORY	0	EXPLORATORY	0
SM20	Lower Shelikof	CLOSED	-	-	-	-
SOUTH MAINLAND DISTRICT TOTAL				0		0
GRAND TOTAL						
		Total GHL All Gear	Total Catch All Gear	Purse Seine		Gillnet
				GHL	Harvest	GHL
		3,475	3,463	2,625	2932	850
				% of GHL	% Harvest	% of GHL
				76%	85%	24%
						15%

^a Sections marked 'Closed' did not open during the 2005 sac roe season. Sections marked 'EXPLORATORY' were open to both gear types, with no set GHL.

Table 4.-Age composition, by percent, of herring samples from the commercial purse seine sac roe fishery harvest, by section, Kodiak Management Area, 2005.

Region	Section	Harvest (tons)	Percent at Age													n
			Age-2	Age-3	Age-4	Age-5	Age-6	Age-7	Age-8	Age-9	Age-10	Age-11	Age-12	Age-13	Age-14+	
Westside	Village Islands	1,311.0	0.0	4.7	14.8	16.7	35.8	6.6	14.3	1.9	1.4	3.3	0.0	0.0	0.0	209
	Inner Uyak Bay	405.9	0.0	2.2	8.8	12.7	28.8	15.5	26.6	1.6	1.1	1.6	0.5	0.0	0.0	180
Eastside	East Sitkalidak Strait	106.1	0.0	2.7	63.8	0.9	2.7	1.8	19.4	0.9	0.9	2.7	3.7	0.0	0.0	108
	West Sitkalidak Strait	173.1	0.0	5.7	68.3	6.4	0.7	3.5	10.0	0.7	0.7	0.7	2.1	0.7	0.0	139
	Barling Bay	136.3	0.0	1.7	64.2	8.9	0.0	3.5	12.5	1.7	1.7	0.0	5.3	0.0	0.0	56
	Outer Kiluida Bay	246.6	0.7	3.4	76.7	9.0	0.9	0.3	0.9	0.7	0.0	1.5	5.0	0.0	0.1	516
	Inner Ugak Bay	167.4	0.0	9.2	23.2	9.6	0.8	2.6	6.1	0.4	1.3	9.6	35.5	1.3	0.0	228
Alitak	Inner Deadman Bay	103.5	0.0	14.7	77.2	2.2	1.1	1.1	2.2	1.1	0.0	0.0	0.0	0.0	0.0	88
	Outer Deadman Bay	81.8	0.0	8.1	78.9	3.4	0.8	2.2	5.3	0.9	0.0	0.0	0.0	0.0	0.0	612
	North Olga Bay	35.7	0.0	4.0	82.8	9.0	0.0	1.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	198
All Samples Combined ^a		2,767.4	0.1	4.8	32.7	12.3	21.5	6.2	13.4	1.5	1.1	2.7	3.2	0.1	0.1	2,334

^a For 'All Samples Combined', the percent of the harvest by section is weighted to the age class data to estimate overall age composition of the purse seine harvest.

Table 5.-Age composition, by percent, of herring samples from the commercial gillnet sac roe fishery harvest, by section, Kodiak Management Area, 2005.

Section	Harvest (tons)	Percent at Age													n
		Age-2	Age-3	Age-4	Age-5	Age-6	Age-7	Age-8	Age-9	Age-10	Age-11	Age-12	Age-13	Age-14+	
Danger Bay	46.6	0.0	0.0	48.6	30.2	15.7	1.3	3.9	0.0	0.0	0.0	0.0	0.0	0.0	76
Village Islands	253.0	0.0	0.0	6.2	16.6	47.9	10.4	14.5	0.0	2.0	0.0	2.0	0.0	0.0	48
Zachar Bay	24.7	0.0	0.0	7.4	37.0	18.5	11.1	25.9	0.0	0.0	0.0	0.0	0.0	0.0	27
Outer Kiluida Bay	14.7	0.0	0.0	87.2	10.6	0.0	0.0	0.0	0.0	0.0	0.0	2.1	0.0	0.0	47
All Samples Combined ^a	339.0	0.0	0.0	15.6	19.7	39.3	8.8	13.2	0.0	1.5	0.0	1.6	0.0	0.0	198

^a For 'All Samples Combined', the percent of the harvest by section is weighted to the age class data to estimate overall age composition of the gillnet harvest.

Table 6.-Average weight (g) by age class of herring samples from the commercial purse seine sac roe fishery harvest, by section, Kodiak Management Area, 2005.

Section	Average Weight at Age (g)													n
	Age-2	Age-3	Age-4	Age-5	Age-6	Age-7	Age-8	Age-9	Age-10	Age-11	Age-12	Age-13	Age14+	
Village Islands	-	71	121	162	181	209	199	199	216	258	-	-	-	209
Inner Uyak Bay	-	83	123	148	169	187	200	150	250	230	194	-	-	180
East Sitkalidak Strait	-	102	131	132	199	215	229	197	233	265	248	-	-	108
West Sitkalidak Strait	-	106	140	175	136	229	247	248	241	250	297	348	-	139
Barling Bay	-	97	134	144	-	222	237	279	296	-	277	-	-	56
Outer Kiluida Bay	52	94	142	165	183	305	270	246	-	284	281	-	364	516
Inner Ugak Bay	-	98	134	151	180	205	230	243	233	257	261	269	-	228
Inner Deadman Bay	-	109	152	162	207	203	288	228	-	-	-	-	-	88
Outer Deadman Bay	-	116	158	192	219	263	281	329	-	-	-	-	-	612
North Olga Bay	-	133	164	183	-	261	256	-	-	-	-	-	-	198

Table 7.-Average weight (g) by age class of herring samples from the commercial gillnet sac roe fishery harvest, by section, Kodiak Management Area, 2005.

Section	Average Weight at Age (g)													n
	Age-2	Age-3	Age-4	Age-5	Age-6	Age-7	Age-8	Age-9	Age-10	Age-11	Age-12	Age-13	Age-14+	
Danger Bay	-	-	124	139	160	169	188	-	-	-	-	-	-	76
Village Islands	-	-	104	137	141	131	184	-	158	-	-	-	-	46
Zachar Bay	-	-	101	145	145	158	181	-	-	-	-	-	-	27
Outer Kiluida Bay	-	-	141	131	-	-	-	-	-	-	323	-	-	47

Table 8.-Herring food and bait commercial fishery harvest, Kodiak Management Area, 1912 to 2005.

Year	Tons	Year	Tons	Year	Tons
1912	20	1944	26,835	1976	No data
1913	0	1945	31,114	1977	No data
1914	0	1946	47,506	1978	399
1915	0	1947	50,743	1979	125
1916	70	1948	46,428	1980	381
1917	138	1949	0	1981	18
1918	118	1950	44,133	1982	326
1919	260	1951	4,299	1983	33
1920	46	1952	1,389	1984	123
1921	945	1953	725	1985	102
1922	1,483	1954	0	1986	213
1923	322	1955	0	1987	217
1924	4,823	1956	13,524	1988	340
1925	9,997	1957	21,219	1989	345
1926	2,681	1958	1,711	1990	313
1927	2,593	1959	3,831	1991	215
1928	625	1960	0	1992	312
1929	No data	1961	0	1993	784
1930	622	1962	0	1994	677
1931	1,000	1963	0	1995	507
1932	3,594	1964	310	1996	651
1933	2,313	1965	35	1997	756
1934	60,000	1966	198	1998	151
1935	No data	1967	300	1999	Closed
1936	24,748	1968	15	2000	Closed
1937	27,659	1969	11	2001	115
1938	24,522	1970	8	2002	135
1939	38,601	1971	44	2003	199
1940	22,677	1972	50	2004	190
1941	40,084	1973	178	2005	162
1942	16,791	1974	40		
1943	35,352	1975	5		
AVERAGE		AVERAGE		AVERAGE	
1912-1943	10,736	1944-1975	9,208	1976-2005	300

Table 9.-Subsistence herring harvest summary for the Kodiak Management Area, 1991-2005.

Year	Permits Issued	Permits Returned	Estimated Harvest in Pounds by District							Total
			Afognak	Northeast	Inner Marmot	Uganik	Uyak	Eastside	Alitak	
1991	50	9	2,110	1,745	1,745	1,000	0	0	0	6,600
1992	45	10	120	250	250	1,000	0	0	320	1,940
1993	50	16	90	3,000	3,910	550	50	0	0	7,600
1994	47	14	90	740	1,350	2,000	200	0	0	4,380
1995	20	6	75	0	500	0	340	0	175	1,090
1996	23	10	550	180	140	0	590	0	0	1,460
1997	16	7	0	200	350	50	1,325	0	0	1,925
1998	18	10	1,240	0	0	50	0	0	0	1,290
1999	15	9	0	200	350	0	425	0	0	975
2000	39	21	575	21,150	0	1,825	0	0	700	24,250
2001	48	19	3,000	0	875	0	1,015	10,500	0	15,390
2002	^a	23	1,170	1,150	420	0	200	903	0	3,843
2003	^a	16	0	220	300	0	420	1,210	30	2,180
2004	^a	22	200	780	450	206	1,570	942	0	4,148
2005	^a	37	300	995	920	160	550	2,255	155	5,335

^a Beginning in 2002 herring was added to the Kodiak subsistence salmon and crab permit; no separate permit was required.

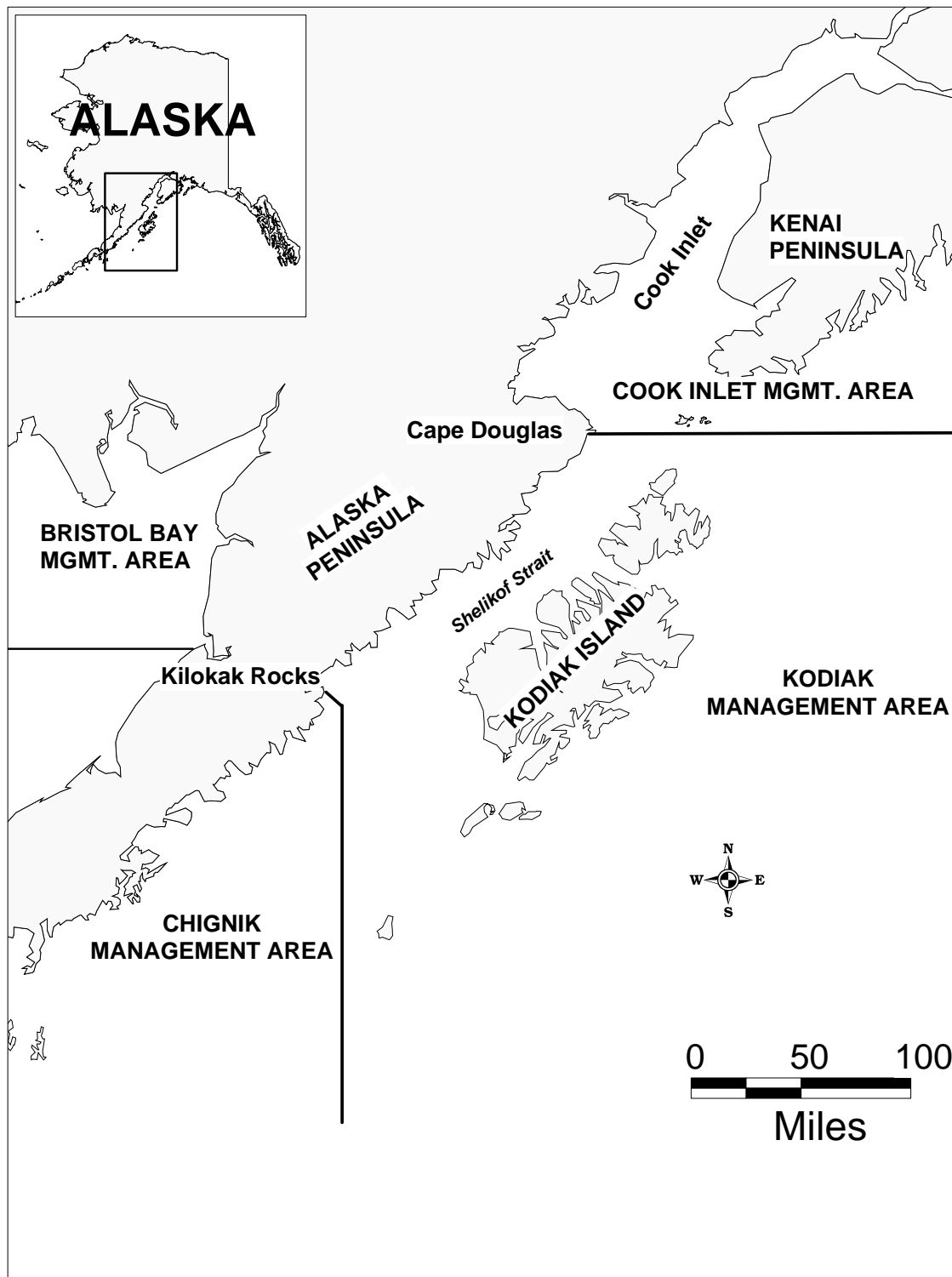


Figure 1.-Map of southwestern Alaska emphasizing the Kodiak Management Area and its relationship to surrounding management areas.

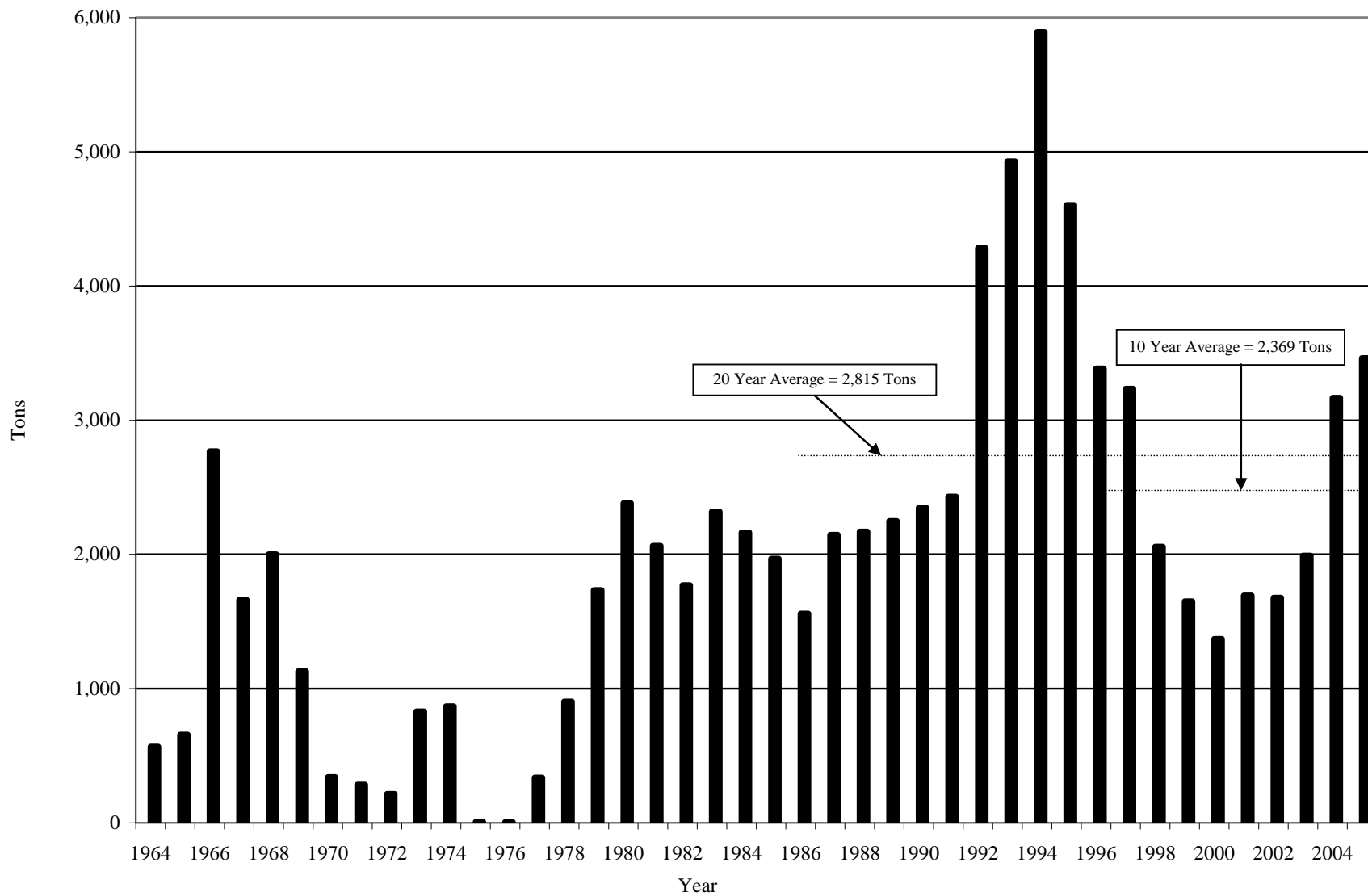


Figure 2.-Herring sac roe commercial fishery harvest, Kodiak Management Area, 1964 to 2005.

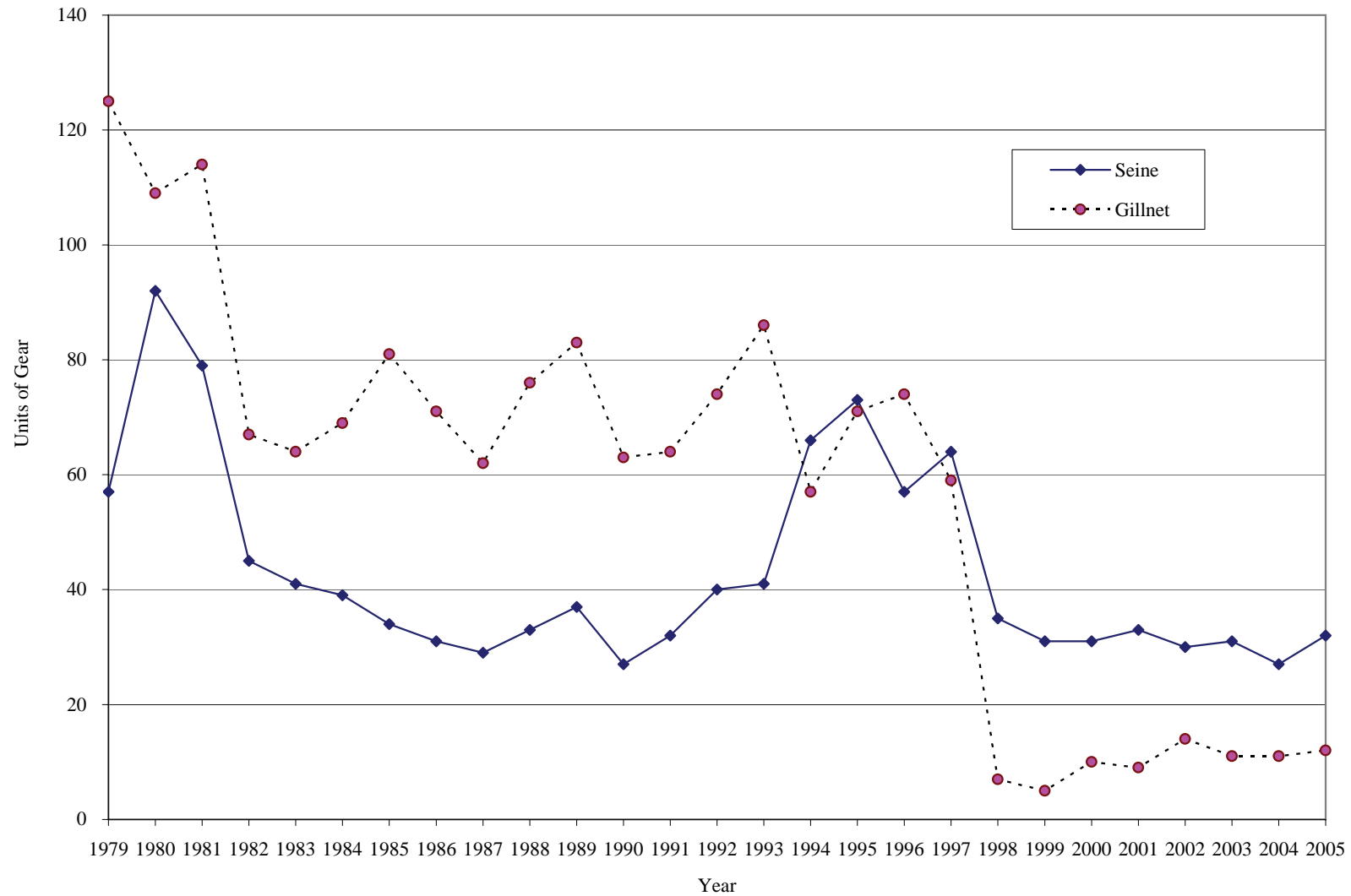


Figure 3.-Units of gear that made a landing from 1979 to 1998 or participated in the 1999 to 2005 herring sac roe commercial fisheries, Kodiak Management Area.

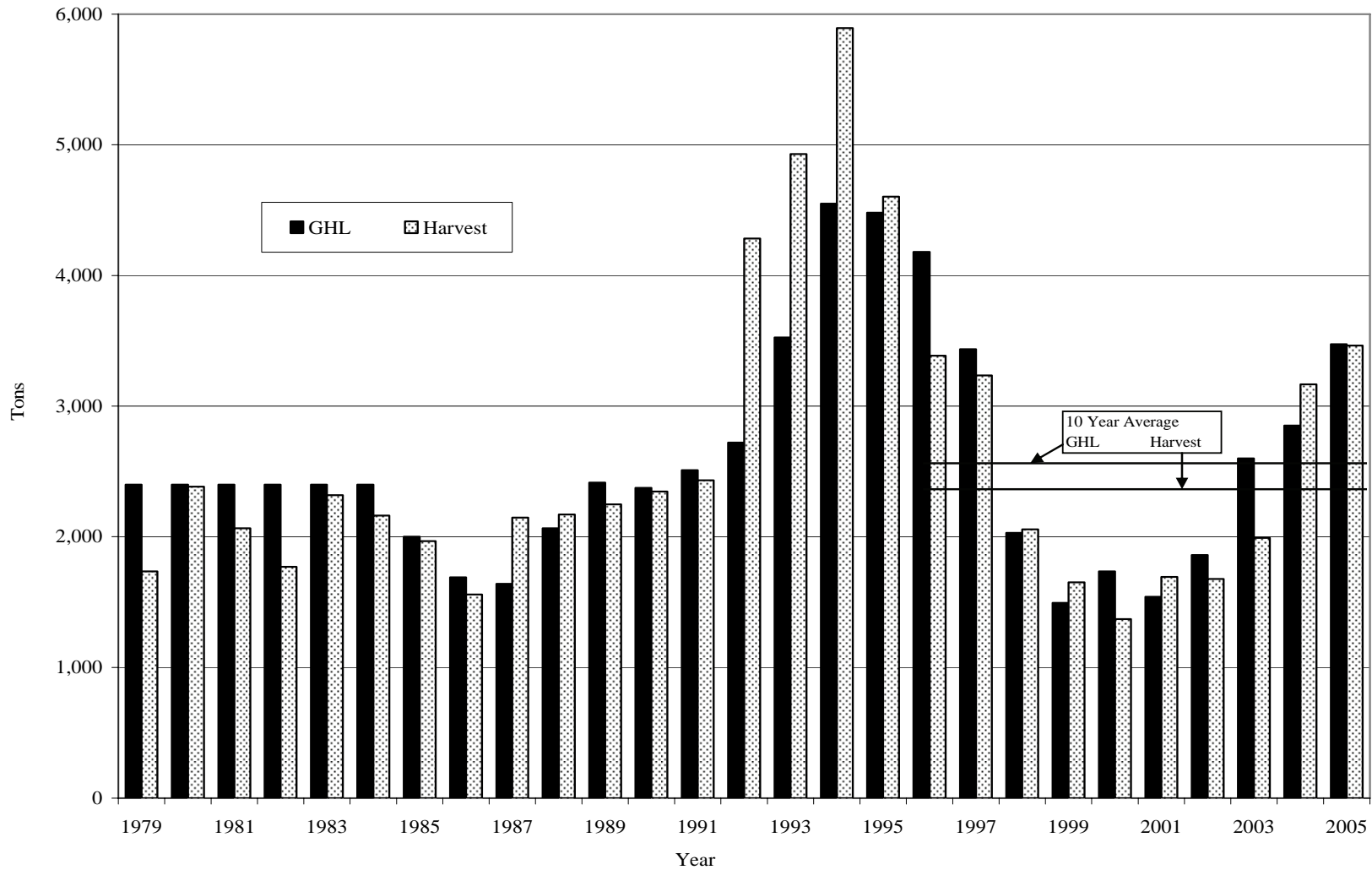


Figure 5.-Comparison of guideline harvest levels (GHLs) to the herring sac roe commercial harvest, Kodiak Management Area, 1979 to 2005.

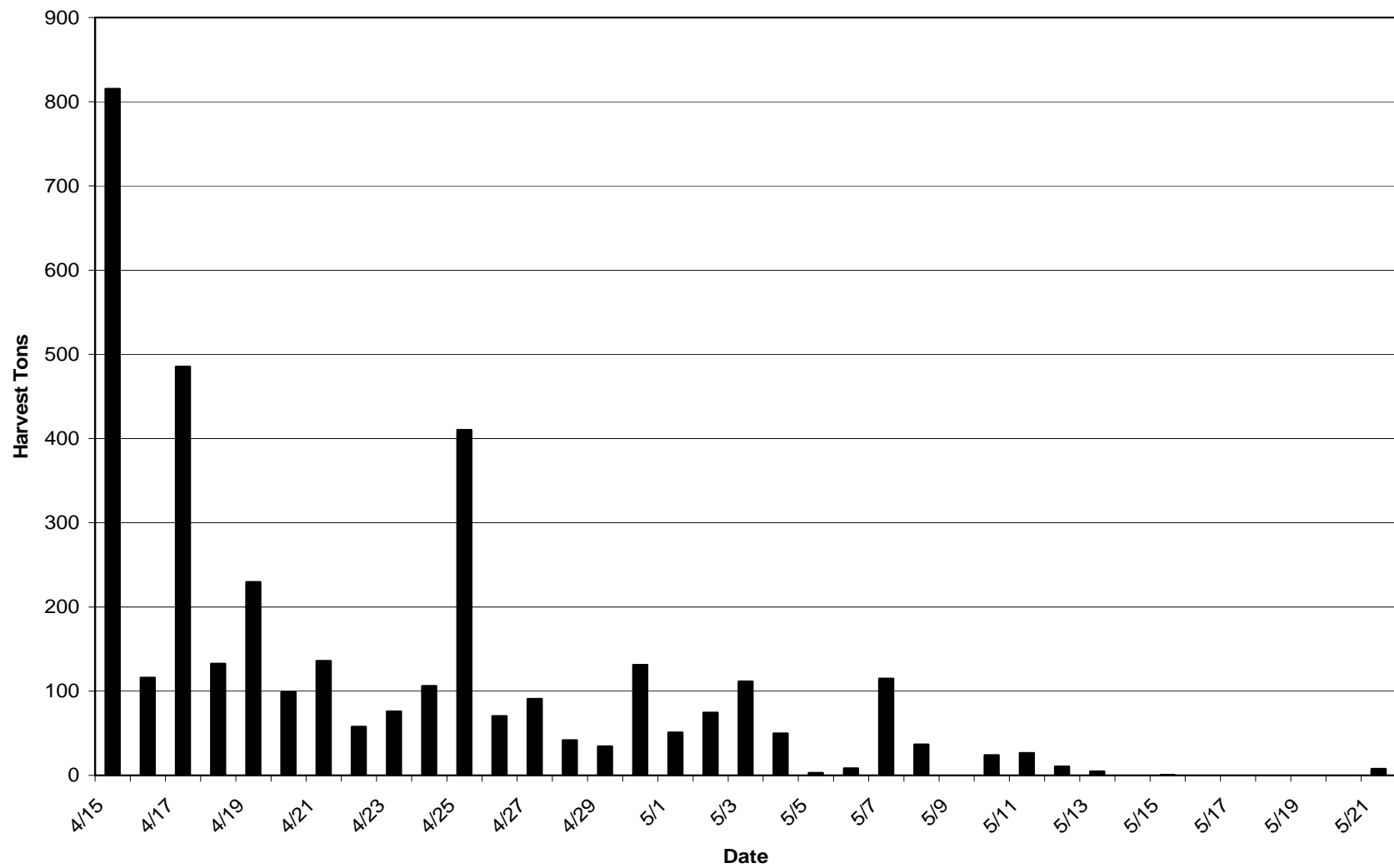


Figure 6.-Herring sac roe fishery harvest by day, Kodiak Management Area 2005.

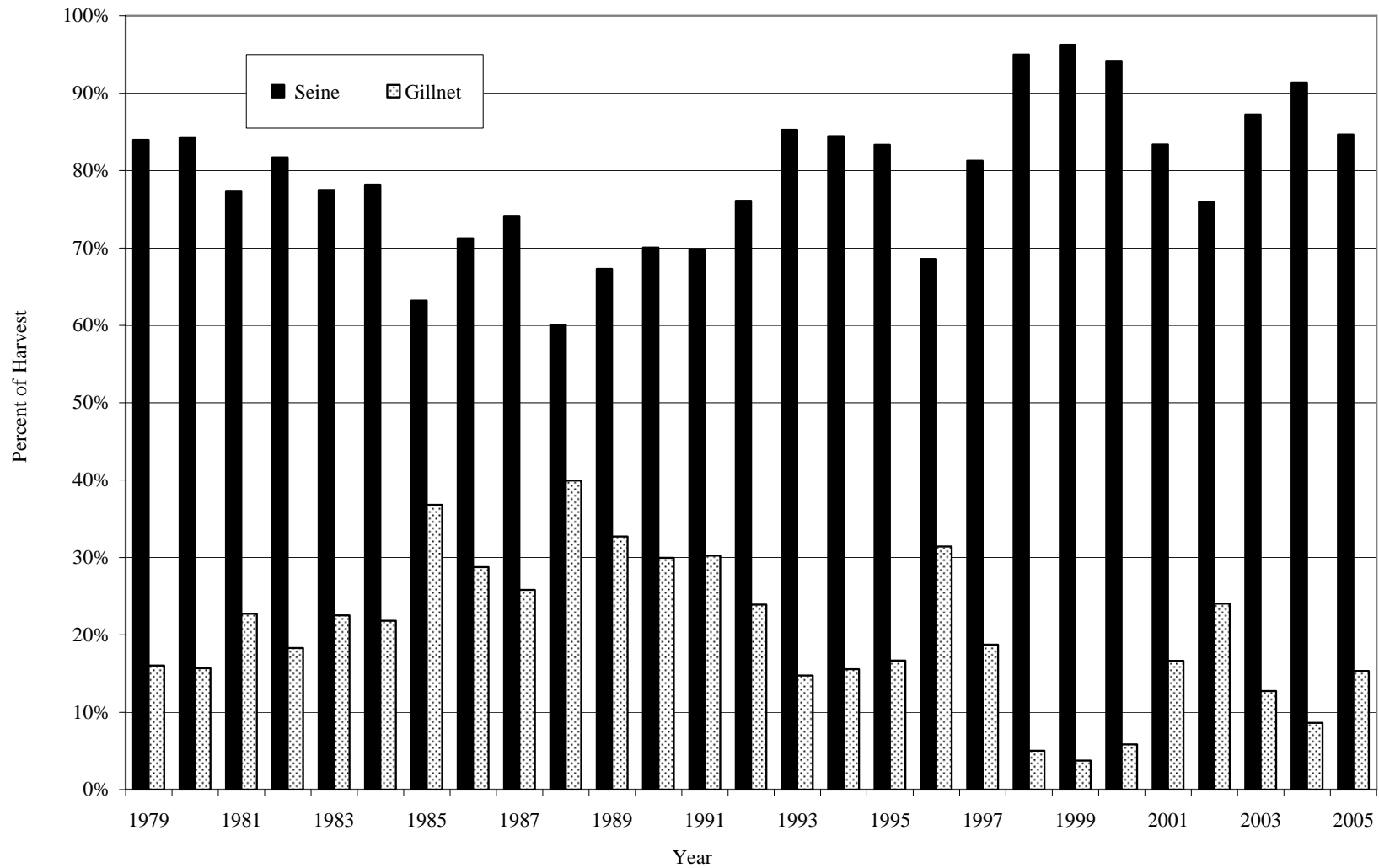


Figure 7.-Percent of the total harvest taken by gear type in herring sac roe commercial fisheries, Kodiak Management Area, 1979 to 2005.

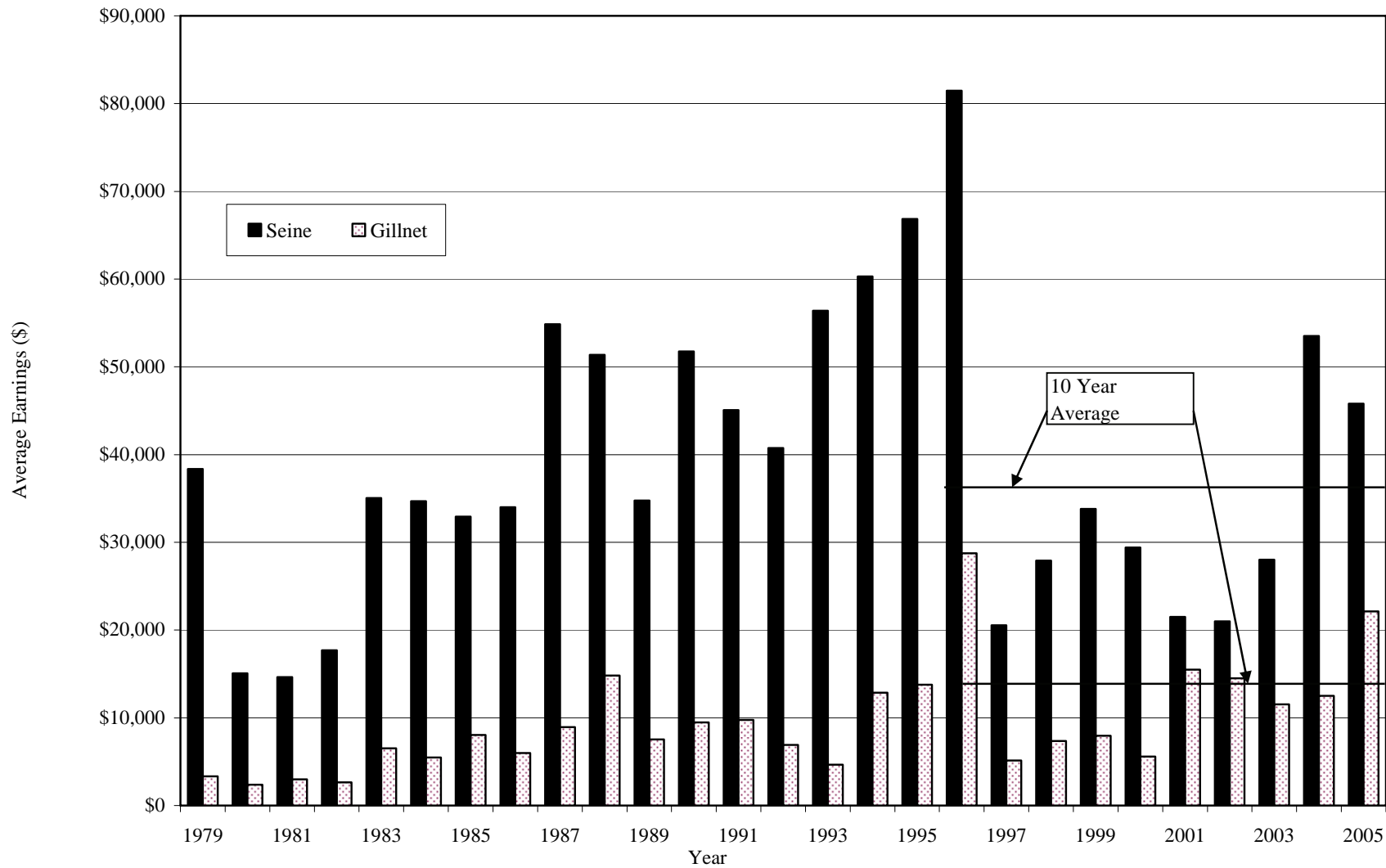


Figure 8.-Average earnings by gear type for herring sac roe commercial fisheries, Kodiak Management Area, 1979 to 2005.

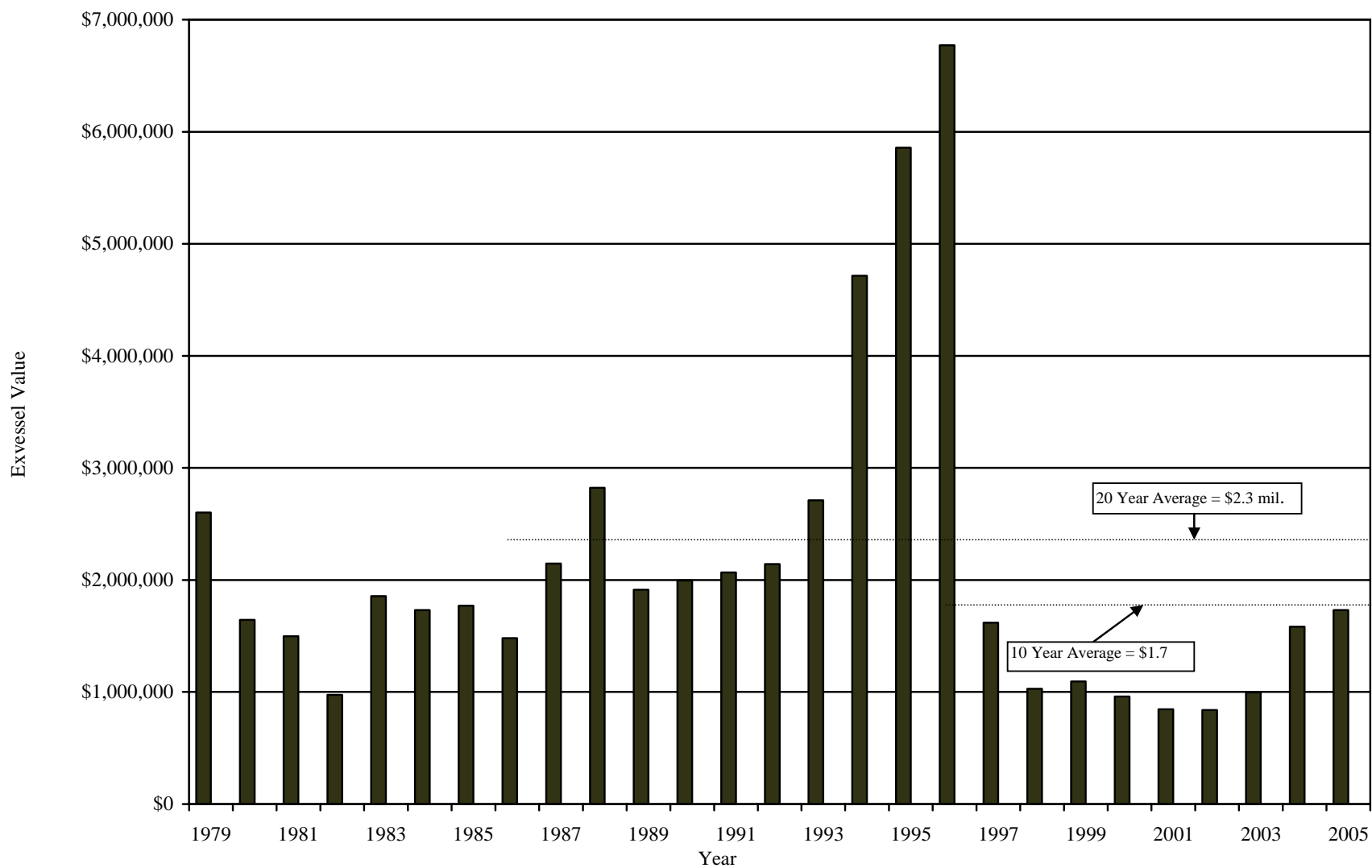


Figure 9.-Total exvessel value for herring sac roe commercial fisheries, Kodiak Management Area, 1979 to 2005.

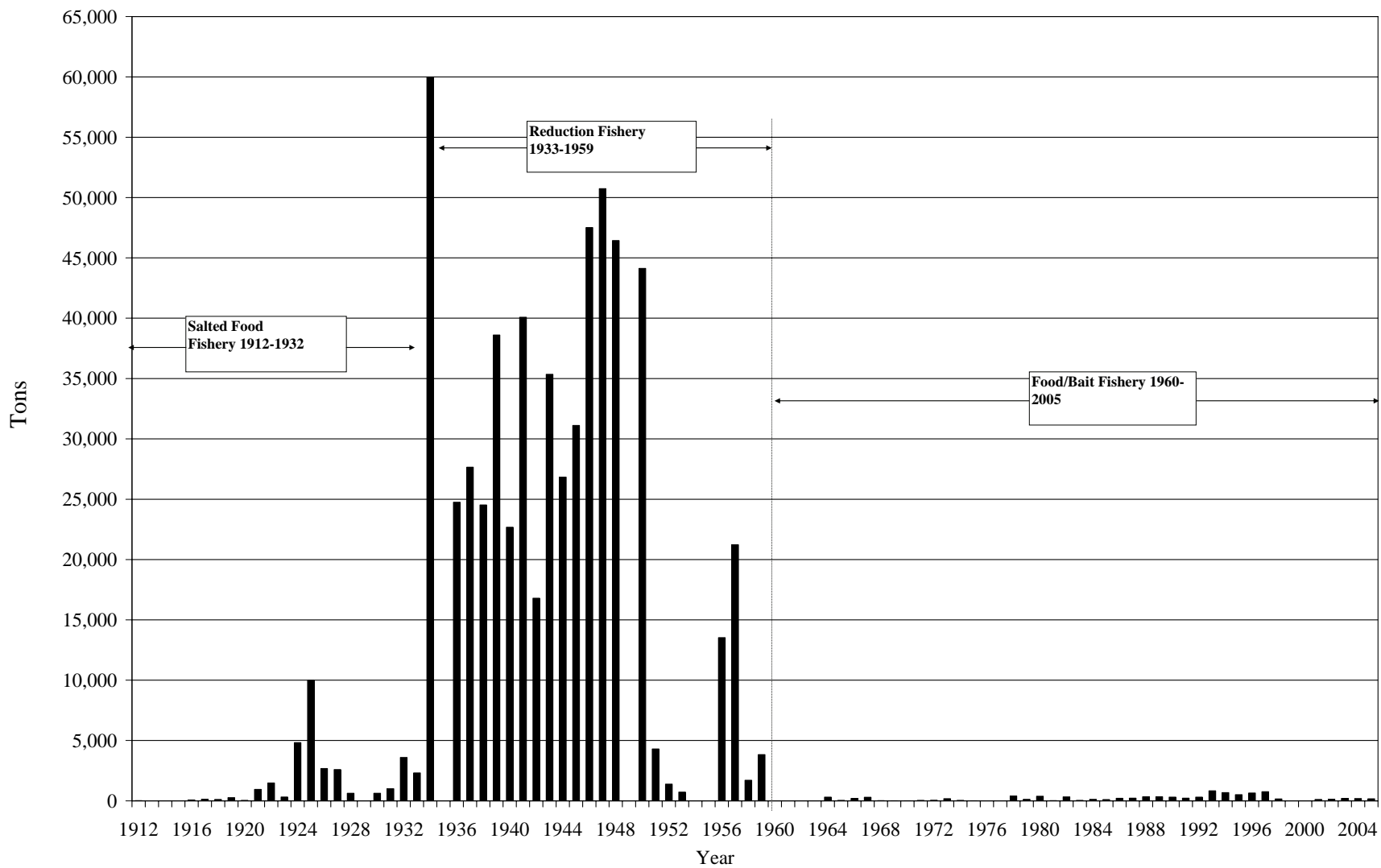


Figure 10.-Herring food and bait commercial fishery harvest, Kodiak Management Area, 1912 to 2005.

**APPENDIX A: SUMMARY OF EMERGENCY ORDERS ISSUED FOR
THE HERRING COMMERCIAL FISHERIES IN THE KODIAK
MANAGEMENT AREA, 2005**

Appendix A1.-Summary of emergency orders issued for herring commercial fisheries, Kodiak Management Area 2005.

Emergency Order #	Issued:	Effective:	Action Taken:
1	2:59 p.m. January 5	3:00 p.m. January 5	<u>Fishing Period:</u> the Eastside District to commercial food/bait herring fishing from 3:00 p.m. January 5 to 3:00 a.m. January 7.
2	noon April 13	noon April 15	<u>Open Sac Roe Fishery:</u> initial opening times and fishing periods by gear and section for sac roe herring fishery announced.
3	1:21 p.m. April 15	1:25 p.m. April 15	<u>Closure:</u> the East Sitkalidak Strait Section (EA30) at 1:25 p.m. April 15.
4	3:30 p.m. April 15	3:30 p.m. April 15	<u>Closure:</u> the Barling Bay Section (EA24) at 3:30 p.m. April 15.
5	4:50 p.m. April 15	5:00 p.m. April 15	<u>Fishing Period:</u> commercial herring fishing will be open for purse seine gear in that portion of the combined Village Islands/Uganik Bay Sections (UG30, 32-34) north of 57° 46.30' N. latitude from 5:00 p.m. to 8:00 p.m. April 15.
6	6:30 p.m. April 15	6:30 p.m. April 15	<u>Closure:</u> the West Sitkalidak Strait Section (EA23) at 6:30 p.m. April 15.
7	6:39 p.m. April 15	6:45 p.m. April 15	<u>Closure:</u> that portion of the combined Village Islands/Uganik Bay Sections (UG30, 32-34) south of 57° 46.30' North latitude to purse seine gear at 6:45 p.m. April 15.
8	11:45 a.m. April 16	12:01 noon April 16	<u>Fishing Period:</u> commercial herring fishing will be open for gillnet gear, in that portion of the combined Village Islands/Uganik Bay Sections (UG30, 32-34) north of 57° 43.10' N. latitude and west of 153° 30.95' W. longitude from 12:00 noon April 16 to 9:00 a.m. April 17.

-continued-

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Emergency Order #	Issued:	Effective:	Action Taken:
9	1:20 p.m. April 17	1:30 p.m. April 17	<u>Fishing Period:</u> commercial herring fishing will be open for purse seine gear in that portion of the Inner Uyak Bay Section (UY30) north of 57° 19.50' N. latitude and south of 57° 21.00' N. latitude, from 1:30 p.m. to 1:40 p.m. April 17.
10	3:10 p.m. April 17	3:30 p.m. April 17	<u>Fishing Period:</u> commercial herring fishing will be open for purse seine gear in that portion of the Inner Uyak Bay Section (UY30) north of 57° 19.00' N. latitude and south of 57° 21.00' N. latitude, from 3:30 p.m. to 4:00 p.m. April 17.
11	3:45 p.m. April 17	4:00 p.m. April 17	<u>Fishing Period:</u> commercial herring fishing will be open for purse seine gear in that portion of the Village Islands/Uganik Bay Sections (UG30 and UG32-34, combined) north of 57° 47.85' N. latitude, from 4:00 p.m. to 6:00 p.m. April 17.
12	5:00 p.m. April 17	5:05 p.m. April 17	<u>Fishing Period:</u> commercial herring fishing will be open for purse seine gear in that portion of the Village Islands/Uganik Bay Sections (UG30 and UG32-34, combined) north of 57° 47.55' N. latitude, from 5:05 p.m. to 6:00 p.m. April 17.
13	5:00 p.m. April 17	5:30 p.m. April 17	<u>Fishing Period:</u> commercial herring fishing will be open for purse seine gear in that portion of the Inner Uyak Bay Section (UY30) north of 57° 19.00' N. latitude and south of 57° 25.00' N. latitude, from 5:30 p.m. to 8:30 p.m. April 17.
14	6:30 p.m. April 17	6:39 p.m. April 17	<u>Closure:</u> the Inner Uyak Bay Section (UY30) of the Uyak District to purse seine gear at 6:39 p.m. April 17.
15	6:35 p.m. April 17	6:40 p.m. April 17	<u>Fishing Period:</u> commercial herring fishing will be open for purse seine gear in that portion of the Village Islands/Uganik Bay Sections (UG30 and UG32-34, combined) north of 57° 47.10' N. latitude, from 6:40 p.m. to 7:30 p.m. April 17.

-continued-

Appendix A1.-page 3 of 8

Emergency Order #	Issued:	Effective:	Action Taken:
16	8:45 a.m. April 18	9:00 a.m. April 18	<u>Fishing Period:</u> commercial herring fishing will be open for gillnet gear in that portion of the Village Islands/Uganik Bay Sections (UG30 and UG32-34, combined) north of 57° 43.10' N. latitude and west of 153° 30.95' W. longitude from 9:00 a.m. April 18 to 9:00 a.m. April 19.
17	11:00 a.m. April 18	noon April 18	<u>Fishing Period:</u> commercial herring fishing will be open for gillnet gear in the Inner Uyak Bay Section (UY30) from 12:00 noon April 18 through 12:00 noon April 20. <u>Fishing Period:</u> commercial herring fishing will be open for gillnet gear in the Inner Uyak Bay Section (UY30) beginning at 12:00 noon April 21, gillnet fishing periods in the Inner Uyak Bay Section will be from 12:00 noon on odd-numbered days to 12:00 noon on even-numbered days (24 hour open periods, followed by 24 hour closed periods).
18	8:00 a.m. April 19	8:00 a.m. April 19	<u>Closure:</u> the Kizhuyak Bay Section (IM40) of the Inner Marmot District at 8:00 a.m. April 19.
19	1:45 p.m. April 19	2:05 p.m. April 19	<u>Fishing Period:</u> commercial herring fishing will be open for purse seine gear in that portion of the Village Islands/Uganik Bay Sections (UG30 and UG32-34, combined) north of 57° 45.20' N. lat. and south of 57° 45.80' N. lat. from 2:05 p.m. to 2:25 p.m. April 19.
20	3:45 p.m. April 19	4:00 p.m. April 19	<u>Fishing Period:</u> commercial herring fishing will be open for purse seine gear in that portion of the Village Islands/Uganik Bay Sections (UG30 and UG32-34, combined) north of 57° 46.00' N. lat. and south of 57° 46.50' N. lat. from 4:00 p.m. to 5:00 p.m. April 19.
21	4:50 p.m. April 19	5:00 p.m. April 19	<u>Fishing Period:</u> commercial herring fishing will be open for purse seine gear in that portion of the Village Islands/Uganik Bay Sections (UG30 and UG32-34, combined) north of 57° 46.00' N. lat. and south of 57° 46.50' N. lat. from 5:00 p.m. to 6:00 p.m. April 19.

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Emergency Order #	Issued:	Effective:	Action Taken:
22	5:50 p.m. April 19	6:00 p.m. April 19	<u>Fishing Period:</u> commercial herring fishing will be open for purse seine gear in that portion of the Village Islands/Uganik Bay Sections (UG30 and UG32-34, combined) north of 57° 46.00' N. lat. and south of 57° 46.50' N. lat. from 6:00 p.m. to 7:00 p.m. April 19.
23	8:45 a.m. April 20	9:00 a.m. April 20	<u>Fishing Period:</u> commercial herring fishing will be open for gillnet gear in that portion of the Village Islands/Uganik Bay Sections (UG30 and UG32-34, combined) north of 57° 43.10' N lat. and west of 153° 30.95' W long. from 9:00 a.m. April 20 to 9:00 a.m. April 21.
24	10:45 a.m. April 21	10:50 p.m. April 21	<u>Fishing Period:</u> commercial herring fishing will be open for purse seine gear in that portion of the Village Islands/Uganik Bay Sections (UG30 and UG32-34, combined) north of 57° 43.20' N lat. and south of 57° 44.50' N lat. from 10:50 a.m. to 11:50 a.m. April 21.
25	11:45 a.m. April 21	11:50 a.m. April 21	<u>Fishing Period:</u> commercial herring fishing will be open for purse seine gear in that portion of the Village Islands/Uganik Bay Sections (UG30 and UG32-34, combined) north of 57° 43.20' N lat. and south of 57° 44.50' N lat. from 11:50 a.m. to 12:50 p.m. April 21.
26	12:45 p.m. April 21	12:50 p.m. April 21	<u>Fishing Period:</u> commercial herring fishing will be open for purse seine gear in that portion of the Village Islands/Uganik Bay Sections (UG30 and UG32-34, combined) north of 57° 43.20' N lat. and south of 57° 44.50' N lat. from 12:50 p.m. to 1:50 p.m. April 21.
27	1:45 p.m. April 21	1:50 p.m. April 21	<u>Fishing Period:</u> commercial herring fishing will be open for purse seine gear in that portion of the Village Islands/Uganik Bay Sections (UG30 and UG32-34, combined) north of 57° 43.20' N lat. and south of 57° 44.50' N lat. from 1:50 p.m. to 2:50 p.m. April 21.

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Emergency Order #	Issued:	Effective:	Action Taken:
28	3:45 p.m. April 21	4:00 p.m. April 21	<u>Fishing Period:</u> commercial herring fishing will be open for purse seine gear in that portion of the Village Islands/Uganik Bay Sections (UG30 and UG32-34, combined) north of 57° 46.00' N lat. and south of 57° 46.50' N lat. from 4:00 p.m. to 5:00 p.m. April 21.
29	4:45 p.m. April 21	5:00 p.m. April 21	<u>Fishing Period:</u> commercial herring fishing will be open for purse seine gear in that portion of the Village Islands/Uganik Bay Sections (UG30 and UG32-34, combined) north of 57° 46.00' N lat. and south of 57° 46.50' N lat. from 5:00 p.m. to 6:00 p.m. April 21.
30	5:45 p.m. April 21	6:00 p.m. April 21	<u>Fishing Period:</u> commercial herring fishing will be open for purse seine gear in that portion of the Village Islands/Uganik Bay Sections (UG30 and UG32-34, combined) north of 57° 46.00' N lat. and south of 57° 46.50' N lat. from 6:00 p.m. to 7:00 p.m. April 21.
31	8:45 a.m. April 22	9:00 a.m. April 22	<u>Fishing Period:</u> commercial herring fishing will be open for gillnet gear in that portion of the Village Islands/Uganik Bay Sections (UG30 and UG32-34, combined) north of 57° 43.10' N lat. and west of 153° 30.95' W long. from 9:00 a.m. April 22 to 9:00 a.m. April 23.
32	3:45 p.m. April 23	4:15 p.m. April 23	<u>Fishing Period:</u> commercial herring fishing will be open for purse seine gear in that portion of the Village Islands/Uganik Bay Sections (UG30 and UG32-34, combined) north of 57° 47.70' N lat. and south of 57° 48.70' N lat. from 4:15 p.m. to 5:15 p.m. April 23.
33	5:05 p.m. April 23	5:15 p.m. April 23	<u>Fishing Period:</u> commercial herring fishing will be open for purse seine gear in that portion of the Village Islands/Uganik Bay Sections (UG30 and UG32-34, combined) north of 57° 47.70' N lat. and south of 57° 48.70' N lat from 5:15 p.m. to 6:15 p.m. April 23.

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Emergency Order #	Issued:	Effective:	Action Taken:
34	6:05 p.m. April 23	6:15 p.m. April 23	<u>Fishing Period:</u> commercial herring fishing will be open for purse seine gear in that portion of the Village Islands/Uganik Bay Sections (UG30 and UG32-34, combined) north of 57° 47.70' N lat. and south of 57° 48.70' N lat. from 6:15 p.m. to 7:15 p.m. April 23.
35	7:05 p.m. April 23	7:15 p.m. April 23	<u>Fishing Period:</u> commercial herring fishing will be open for purse seine gear in that portion of the Village Islands/Uganik Bay Sections (UG30 and UG32-34, combined) north of 57° 47.70' N lat. and south of 57° 48.70' N lat. from 7:15 p.m. to 8:15 p.m. April 23.
36	8:45 a.m. April 24	9:00 a.m. April 24	<u>Fishing Period:</u> commercial herring fishing will be open for gill net gear in that portion of the Village Islands/Uganik Bay Sections (UG30 and UG32-34, combined) north of 57° 43.10' N lat. and west of 153° 30.95' W long. from 9:00 a.m. April 24 to 9:00 a.m. April 25.
37	1:25 p.m. April 25	1:30 p.m. April 25	<u>Fishing Period:</u> commercial herring fishing will be open for purse seine gear in that portion of the Village Islands/Uganik Bay Sections (UG30 and UG32-34, combined) north of 57° 46.00' N lat. and south of 57° 46.50' N lat. from 1:30 p.m. to 2:30 p.m. April 25.
38	2:20 p.m. April 25	2:30 p.m. April 25	<u>Fishing Period:</u> commercial herring fishing will be open for purse seine gear in that portion of Village Islands/Uganik Bay Sections (UG30 and UG32-34, combined) north of 57° 46.00' N lat. and south of 57° 46.50' N lat. from 2:30 p.m. to 3:30 p.m. April 25.
39	5:45 p.m. April 25	5:30 p.m. April 25	<u>Fishing Period:</u> commercial herring fishing will be open for purse seine gear in that portion of Village Islands/Uganik Bay Sections (UG30 and UG32-34, combined) north of 57° 46.00' N lat. and south of 57° 47.10' N lat. from 5:50 p.m. to 6:50 p.m. April 25. The purse seine GHF has been met and will not reopen.

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Emergency Order #	Issued:	Effective:	Action Taken:
40	9:30 p.m. April 25	9:00 p.m. April 25	<u>Closure:</u> the Inner Ugak Bay Section (EA51) of the Eastside District at 9:00 p.m. Monday April 25.
41	8:45 a.m. April 26	9:00 a.m. April 26	<u>Fishing Period:</u> commercial herring fishing will be open for gillnet gear in that portion of Village Islands/Uganik Bay Sections (UG30 and UG32-34, combined) north of 57° 43.10' N lat. and west of 153° 30.95' W long. from 9:00 a.m. April 26 to 9:00 a.m. April 27.
42	10:45 p.m. April 26	12:01 a.m. April 27	<u>Closure:</u> the Village Islands/Uganik Bay Sections (UG30 and UG32-34, combined) of the Uganik District will close to gillnet gear at 12:01 a.m. April 27.
43	2:30 p.m. April 30	12:01 p.m. April 30	<u>Closure:</u> the Izhut Bay (SA10), Kitoi Bay (SA20), and MacDonald Lagoon (SA30) Sections of the Afognak District at 12:01 p.m. April 30.
44	11:00 a.m. May 2	11:10 a.m. May 2	<u>Closure:</u> the Inner Deadman Bay Section (AL21) of the Alitak District at 11:10 a.m. May 2.
45	11:00 a.m. May 2	12:01 p.m. May 2	<u>Closure:</u> the Womens Bay Section (NE10) of the Northeast District at 12:01 p.m. May 2.
46	8:00 p.m. May 3	8:25 p.m. May 3	<u>Closure:</u> the Outer Deadman Bay Section (AL22) of the Alitak District at 8:25 p.m. May 3.
47	11:10 a.m. May 4	12:00 noon May 4	<u>Closure:</u> the North Olga Bay Section (AL41) of the Alitak District at 12:00 noon May 4.
48	7:15 p.m. May 7	7:28 p.m. May 7	<u>Closure:</u> the Inner Alitak and Portage Bay Sections (AL20 and AL41) of the Alitak District at 7:28 p.m. May 7.
49	7:45 p.m. May 7	8:00 p.m. May 7	<u>Closure:</u> the Outer Kiluida Bay Section (EA43) of the Eastside District at 8:00 p.m. May 7.

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Emergency Order #	Issued:	Effective:	Action Taken:
50	11:00 a.m. May 10	12:00 noon May 10	<u>Closure:</u> the Shearwater Bay Section (EA42) of the Eastside District at 12:00 noon May 10.
51	11:00 a.m. May 12	12:00 noon May 12	<u>Closure:</u> the Zachar Bay Section (UY40) of the Uyak District at 12:00 noon May 12.
52	3:00 p.m. September 27	12:00 noon September 28	<u>Open Food/Bait Fishery:</u> conditions for co-op fishery established. <u>Fishing Period:</u> that portion of the Uganik District south of the latitude of Miners Point will open at 12:00 noon September 28 and will remain open until the GHL has been reached.
53	10:00 a.m. December 22	10:00 a.m. December 22	<u>Closure:</u> that portion of the Uganik District (Food/Bait Statistical Area 4) south of the latitude of Miners Point at 10:00 a.m. December 22.